

JUNE 1952

ARMY INFORMATION DIGEST

Progress in European Defense

Three Years of NATO

Aircraft for the Army

Laboratory for the Fleet

In Peace Prepared for War

Medical Advances in Korea

Toward Stability in the Far East

Training for Hemisphere Defense

Red China's Fighting Hordes—Part V

Long-Range Strategy for a Lasting Peace



ARMY INFORMATION DIGEST



ARMY INFORMATION DIGEST, an official Department of the Army publication, is published monthly under the supervision of the Commandant, Armed Forces Information School, Fort Slocum, New York, on behalf of the Chief of Information, Department of the Army. The DIGEST provides timely and authoritative information on the policies, plans and operations of the Department of Defense, the Department of the Army, the other services and the reserve components. Material in the DIGEST may be reprinted provided credit is given to ARMY INFORMATION DIGEST and to the author. Manuscripts on subjects of general interest to the Armed Forces are invited. Direct communication is authorized to: Editor, ARMY INFORMATION DIGEST, Fort Slocum, New York. Back issues, as available, may be obtained upon request.

The printing of this publication has been approved by the Director of the Bureau of the Budget, 21 May 1951.

DISTRIBUTION:

ACTIVE ARMY

Admin & Tech Svc Bd (1); AFF (75); AA Comd (5); MDW (29); A (26); CHQ (12); Div (16); Brig (3); Regt (4); Bn (2); Co (1); FT (4); Sch (25) except USMA, C&GSC, AWC, AFIS; PMS&T (2); Dep (2); Hosp (15) except Gen Hosp (80); Pers Cen (3); POE (4); Ars (2); Dist (1) except Mil Dist (2); Rct Dist (4); Rct Sta (1); Rct Sub Sta (1); Dspln Bks (5); Div Engr (1).

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In This Issue:



FREE WORLD'S AWAKENING. "The enormity of the present threat will never be met by half-hearted measures or by any superficial military facade. Required is the full awakening of the free world and the pursuit of energetic, far-reaching measures to insure our form of life—even our survival," the Supreme Allied Commander Europe emphasizes in his report on the first year of SHAPE operations. And while no absolute security is yet achieved in Europe, there is no reason for defeatism. Despite Communist stratagems, considerable progress has been made. The contrast between the condition of Europe's defenses at the time of SHAPE's inception and the strength today is a heartening augury of progress to come. Extracts from General Eisenhower's report are highlighted in this issue. Accompanying the lead article is a pictorial feature on "Three Years of NATO."

MILESTONE. June marks the second anniversary of the onset of hostilities in Korea. There a unique international fighting force, forged in adversity and tempered under fire, has been created under the United Nations banner. Besides serving as a testing ground for evaluating weapons and modernizing combat methods, Korea has given the free nations a revelatory insight into the ruthless nature of the Communist foe. "My recent combat experiences in Korea convince me that the enemy on our future battlefields will be the most ruthless, the most cunning, the most unprincipled and the most careless of the lives of his own men, of any antagonist in modern warfare," asserts the former Commanding General of X Corps in "Toward Stability in the Far East."

TAKING THE INITIATIVE. A far-sighted military policy that takes the initiative for peace as a deterrent to war is advocated by the Chairman of the Joint Chiefs of Staff in "Long-Range Strategy for World Peace."

Subscriptions (\$1.75 per year to domestic or APO addresses; \$2.25 to other addresses) may be forwarded to Book Department, Armed Forces Information School, Fort Slocum, New York, or Superintendent of Documents, Government Printing Office, Washington 25, D. C.; single issues (price 15 cents) through Superintendent of Documents only.

☆ U. S. Government Printing Office : 1952

ARMY INFORMATION DIGEST

Vol. 7 No. 6

June 1952

CONTENTS

One Year of Progress in European Defense.....	3
General of the Army Dwight D. Eisenhower, USA	
Three Years of NATO.....	9
Toward Stability in the Far East.....	16
Lieutenant General Edward M. Almond, USA	
Medical Advances in Korea.....	21
Major General George E. Armstrong, USA	
Long-Range Strategy for a Lasting Peace.....	27
General of the Army Omar N. Bradley, USA	
Laboratory for the Fleet.....	33
Captain Fred W. Walton, USN	
Aircraft for the Army.....	39
Major G. W. Kilmer, USA	
In Peace Prepared for War.....	45
Major General Horace L. McBride, USA	
Training for Hemisphere Defense.....	53
Captain Stanley Lewis, USA	
Red China's Fighting Hordes—Part V.....	55
Lieutenant Colonel Robert B. Rigg, USA	



U. S. Army Photograph

GENERAL OF THE ARMY DWIGHT D. EISENHOWER

ONE YEAR OF PROGRESS IN EUROPEAN DEFENSE

ONE year ago [on 2 April 1951] Supreme Headquarters Allied Powers Europe assumed operational command of the troops actually stationed in Europe for the defense of the North Atlantic Treaty area. The purpose of our governments was a very simple one—to retain the peace through establishing a sound collective security. This purpose was, in complete conformity with the spirit and intent of the United Nations Organization, a regional pact to maintain the peace.

The organization of all of these independent countries to establish a military organization was, of course, a rather complicated thing. They had many a task to achieve before their objectives could be attained. As we proceed along the path toward the attainment of objectives that reach into our spiritual, our economic and our military activity, progress sometimes seems distressingly slow. My staff and I have prepared a report on the progress we have achieved. One of its purposes will be to fight any discouragement that might come about from the realization that objectives are still a long way off. Let us see how far we have come.

As in all things human, this report will be neither wholly white nor wholly black. We have had our discouragements just as we have had our important advancements. On the discouraging side, for example, we have had the strained economies of Europe, a developing and threatening slowing up of previously predicted schedules. We know that in spite of the expenditures of vast sums of money in the United States and elsewhere, the flow of equipment has not been as rapid as previously predicted. We have had Indo-China, Korea, Malaya, all sore spots in the world, and each with its terrific impact upon our efforts. But the countries of Europe that feel they have a duty to the free world to carry on those struggles are doing it just as is the United States in Korea with its allies and detachments from so many different countries.

On the encouraging side there has been almost a revolutionary

Extracts from the First Annual Report of the Supreme Allied Commander Europe, General of the Army Dwight D. Eisenhower.

rise in morale of the armed forces. Their training is efficient, directed by some of the most experienced soldiers, sailors and airmen alive today. In each case, in each unit there is a growing confidence that they can do their job—the job that they have been given by our United Nations. There has been the accretion of Greece and of Turkey to our organization, two sturdy nations adhering to our Treaty in the full spirit, the full determination and confidence that the others have shown. There has been also in recent months a sudden and rapid upswing in the rate of munitions delivery. As the gigantic production machines of the civilized world have gotten into the swing of deliveries, munitions are beginning to flow and there will be a rapid increase in the speed with which units are produced upon the fields of Western Europe.

A very important—possibly the most important—development of this last year has been the growing realization in Western Europe that its security, its peace, its future lie in a closer union among the several nations of this part of the Continent, and so we have had the Schuman Plan, soon to go into operation. We have had developed the European Defense Organization, an army designed to bring Germany into the western defense organization under conditions of substantial equality and of self-respect but in such a way as not to arouse again the fears and trepidations of the other nations of Western Europe. The Treaty setting up that kind of an army is soon to be signed, but along with it, we have the great prospect of real peace with Western Germany—a solidified organism that will be a great tower of strength instead of continuing weakness and setbacks due to economic distress.

We here at SHAPE, an organization made up of many nations, deal with these questions day by day. I assure you there is no doubt in our minds that the people of the United Nations organization can do this job. It is merely a matter of self-confidence, the unity that comes through realizing that the enlightened self-interest of each is tied up in the whole success of collective security, optimism, faith and, finally, tenacity.

[Following are pertinent extracts from General Eisenhower's report summarizing some of its salient features.]

April 1951

In Western Europe one year ago there were fewer than fifteen NATO divisions adequately trained and equipped for war. National service programs existing in all European member

countries had trained, or partially trained, a reservoir of manpower since the end of World War II. Unfortunately, equipment was inadequate to convert this pool into effective reserve divisions. In the air the situation was no better, perhaps worse. We had fewer than one thousand operational aircraft available in all Western Europe and many of these were of obsolescent types. From the naval viewpoint we were much better off, although a tremendous effort would be required to offset the threat of submarine attack on vital sea routes.

* * *

The greatest concentration of Western air and ground strength was in Germany. Organized within American, British and French zones, the forces were deployed for the purpose for which they were designed—occupation and police duties. Their deployment had no relationship to what would be suitable in resisting attack. Airfields were crowded up in the forward areas, in some cases in front of the ground troops that must cover them. Supply lines for British and American forces ran almost parallel to the front, to the North German ports of Hamburg and Bremerhaven, instead of rearward through France and the Low Countries. We knew that before any division would be engaged more than forty-eight hours, it would require supply shipments of upwards of five hundred tons a day. For air units, the supply load was comparably heavy; the jet airplane burns more than a ton of fuel per hour. Obviously, a tremendous amount of depot and airfield construction would be required before our forces in this vital area were astride adequate communication routes.

* * *

The United States and Great Britain alone possessed previously formed and disposable reserves and they proceeded to deploy additional strength in Germany—four divisions from America and two from the United Kingdom. France already had the equivalent of four divisions in Germany. Air reinforcement, although sorely needed, had to await the accomplishment of major programs for air crew training, production of aircraft and construction of additional airfields.

* * *

All seven of the continental members of SHAPE had been overrun in World War II and occupied for long periods. Their military formations had been disbanded and the supporting industrial and organizational network, essential to military

establishments, had partially disintegrated. Actually several of the countries had never possessed a modern military establishment. With those, everything had to be built from the ground up.

* * *

The national units pledged to this command a year ago were for the most part poorly equipped, inadequately trained and lacking essential support in both supplies and installations. Because of their weakness on all fronts, and the absence of central direction, they could have offered little more than token resistance to attack.

April 1952

Viewed separately as military, economic and political achievements, the gains may not be spectacular; but taken as a whole they have created a profound change in morale, the basic factor of all.

Already our active forces have increased to a point where they could give a vigorous account of themselves, should an attack be launched against us. In terms of army divisions, whether in service or quickly mobilizable, our forces in Western Europe have nearly doubled in numbers.

* * *

Today the combat readiness of our troops has improved markedly. Readjustments in their development have enhanced their potential effectiveness against the threat from the East. Behind them is a steadily expanding supply system and a command organization to plan and direct their co-ordinated efforts. Still far—disappointingly far—from sufficient for a determined defense, they represent a fighting force in whose spirit and increasing fitness our nations can take considerable pride.

* * *

Our member countries have pledged to produce this year fifty divisions for European defense, exclusive of those to be provided by the two new NATO nations, Greece and Turkey. Roughly one half of the fifty divisions will be standing forces; the remainder are planned as reserve divisions available for employment at periods varying from three to thirty days.

* * *

Along with the divisions furnished, each nation must produce a variety of combat and service support elements such as engineers, heavy artillery, communications, transport, and

supply and maintenance units, to maintain these divisions in the field. When combined with other needs such as antiaircraft defenses, these requirements raise manpower and equipment totals to twice or three times those represented within the combat divisions. The building of these priority reserve divisions and of similar forces to follow them represents one of the most difficult and urgent problems now before us.

Preparations are now in progress for a co-ordinated set of maneuvers during the coming year to weld standing and reserve forces into integrated, battle-worthy commands.

* * *

During the last year some thirty airfields have been put into use, but these were largely an inheritance from previous European construction programs and involved improvements on fields already in existence. A vast amount of new construction is needed to accommodate the air power necessary to the defense of the West.

* * *

As presently scheduled, NATO's European air arm will include by the end of 1952 some four thousand operational aircraft, a significant proportion of which will be modern jet fighters. When realized, this air strength will amount to a greatly improved situation over what we faced a year ago but it will still be far from our ultimate requirements.

* * *

The naval equation in Western European waters is still weighted strongly in our favor. Deficiencies exist in mine sweepers, anti-submarine craft and harbor defense installations, but efforts are being made toward filling these needs. The main advance on the naval side has been realized in the excellent co-ordination and common procedures evolved by Allied navies in European waters.

* * *

During the past eighteen months every Western European nation represented in SHAPE has increased the length of its conscription period. Defense budgets were also raised; and among these continental members military expenditures now average more than twice the pre-Korean level.

* * *

At this time the forces assigned to SHAPE are not of themselves sufficient to stay the hand of an aggressor. Of some com-

fort in this bleak realization is the existence of other military forces of the NATO countries in adjacent areas. At sea there is the British Home Fleet and other Allied naval forces in the Mediterranean and in European coastal waters. From its bases in the United Kingdom, the R. A. F. Fighter Command could contribute greatly in the air battle against Soviet attack. The United States Strategic Air Command, with bases in the United Kingdom and North Africa, possesses tremendous capability, acting both independently and in support of European defense forces. The resources of the British Bomber Command would also be of great value in war. These forces together not only add much to over-all Allied strength but must certainly give food for thought to a potential enemy. Yet they can be used to the full only so long as we securely retain continental bases.

* * *

A significant and growing proportion of the military equipment being provided by the United States to its NATO partners is soon to be produced in European factories. The rate of production of equipment, such as aircraft engines, guns, ammunition and radio sets, is rising and will continue to rise, with the objective of re-establishing in Europe a level of production capable of satisfying future military requirements. Jet fighters, tanks, military vehicles and similar heavy equipment are now produced on a small scale in regions where, for several years, all such production had ceased.

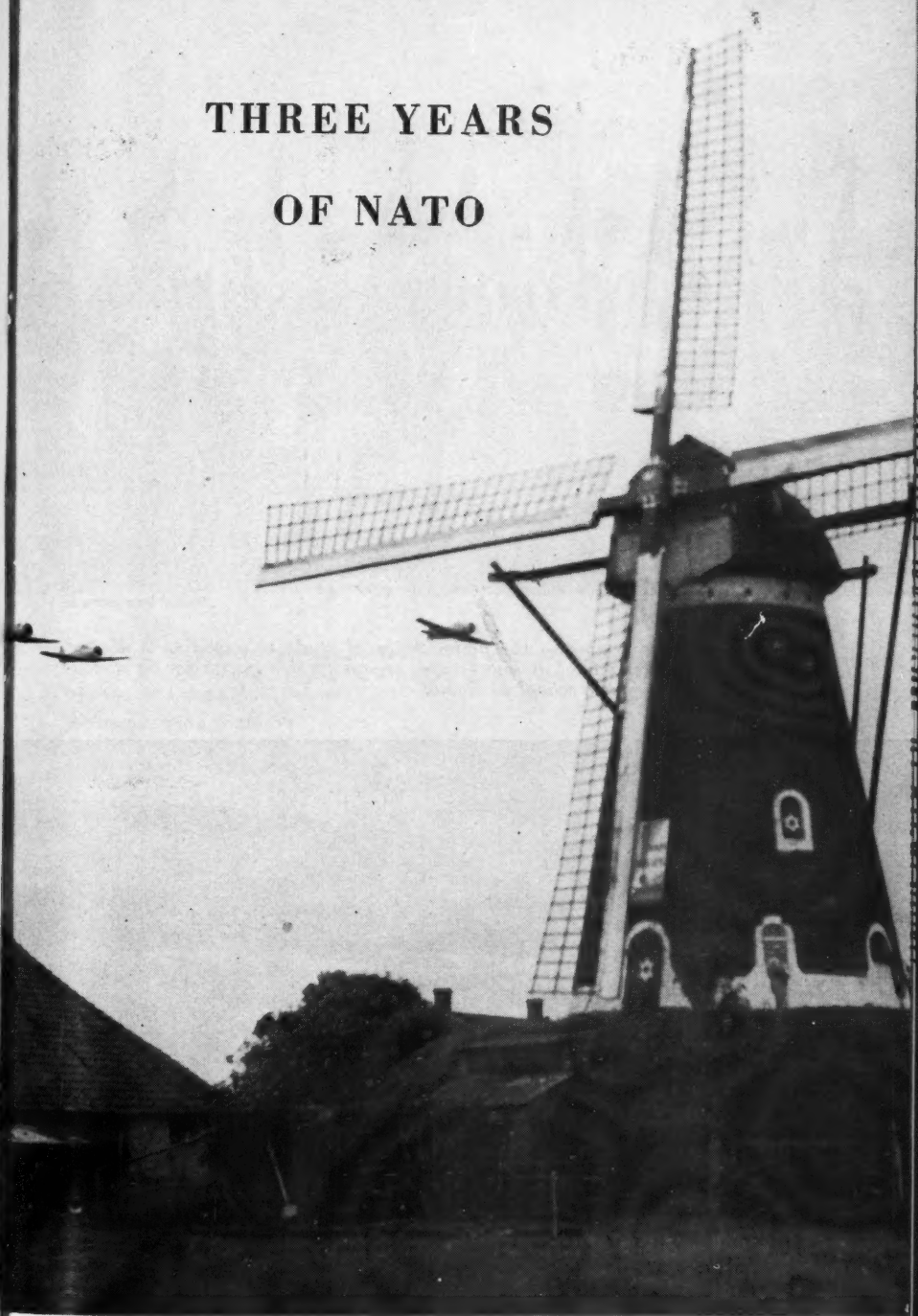
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The situation of the free world is brighter than it was a year ago. At Lisbon our member nations made great headway on issues vital to our continued progress. They strengthened our eastern flank by bringing into NATO the stout-hearted peoples of Greece and Turkey. They agreed to the concept of a European Defense Community and a close relationship with the German Federal Republic. They approved a program to establish this year a force of fifty standing and reserve divisions and four thousand aircraft. When combined with the ready strength available in Greece and Turkey, this force—if properly armed and trained—should produce an encouraging degree of security. . . . Now our governments must convert the Lisbon program into actuality. It demands full and unstinting support, for only through positive action by all our nations can we ever achieve tranquility and security.

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THREE YEARS OF NATO



Swift birds of war skimming over a pastoral scene in Holland typify the protection of the entire free world so earnestly sought by the North Atlantic Treaty Organization.

U. S. Army Photograph



USAF Photograph

Massed colors symbolize the nationalities of students attending a United States jet fighter school. Below—Italian troops receive instruction in camouflage techniques at a school in Rome.

U. S. Army Photograph

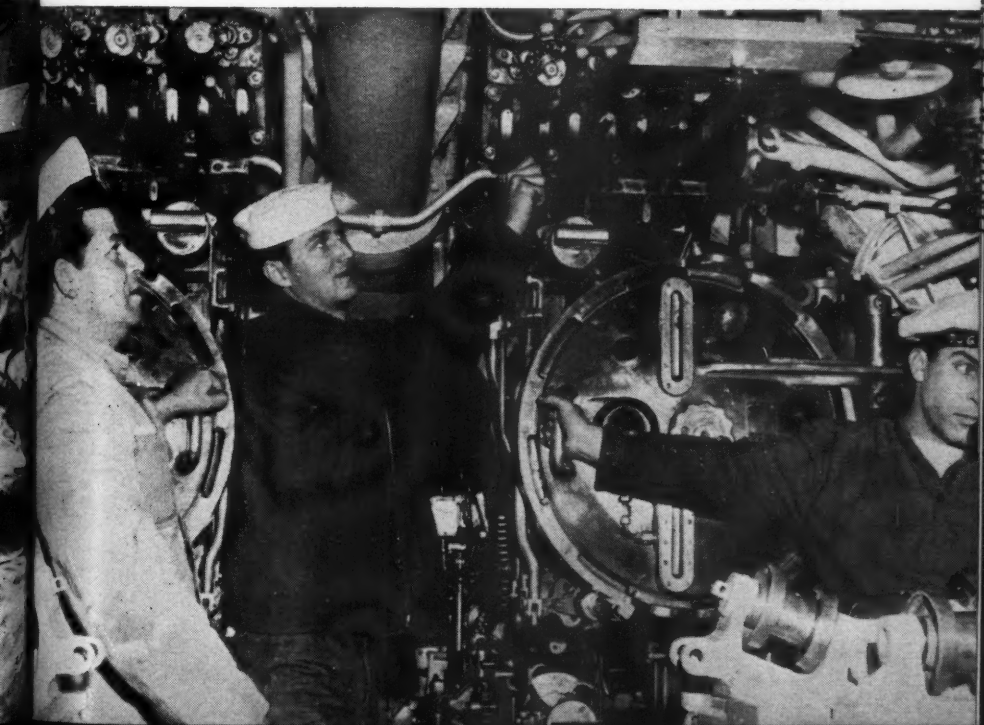




U. S. Navy Photograph

A United States destroyer is refueled by a cruiser during combined exercises in the Mediterranean. Below—Turkish sailors operate a United States submarine in Long Island Sound.

U. S. Navy Photograph





U. S. Army Photograph

Ranging from the valleys to peaks, Italian mountain and ski troops prepare for a climb into the Alps. Below—Belgian, Dutch and Luxembourg troops get realistic weapons training in historic Bastogne, Belgium.

U. S. Army Photograph





U. S. Army Photograph

General of the Army Dwight D. Eisenhower inspects a United States armored unit, typical of those manning Western Europe defenses and training allied troops there. Below—A French armored unit mans a shipment of American-made Sherman tanks at Marburg, Germany.

U. S. Army Photograph



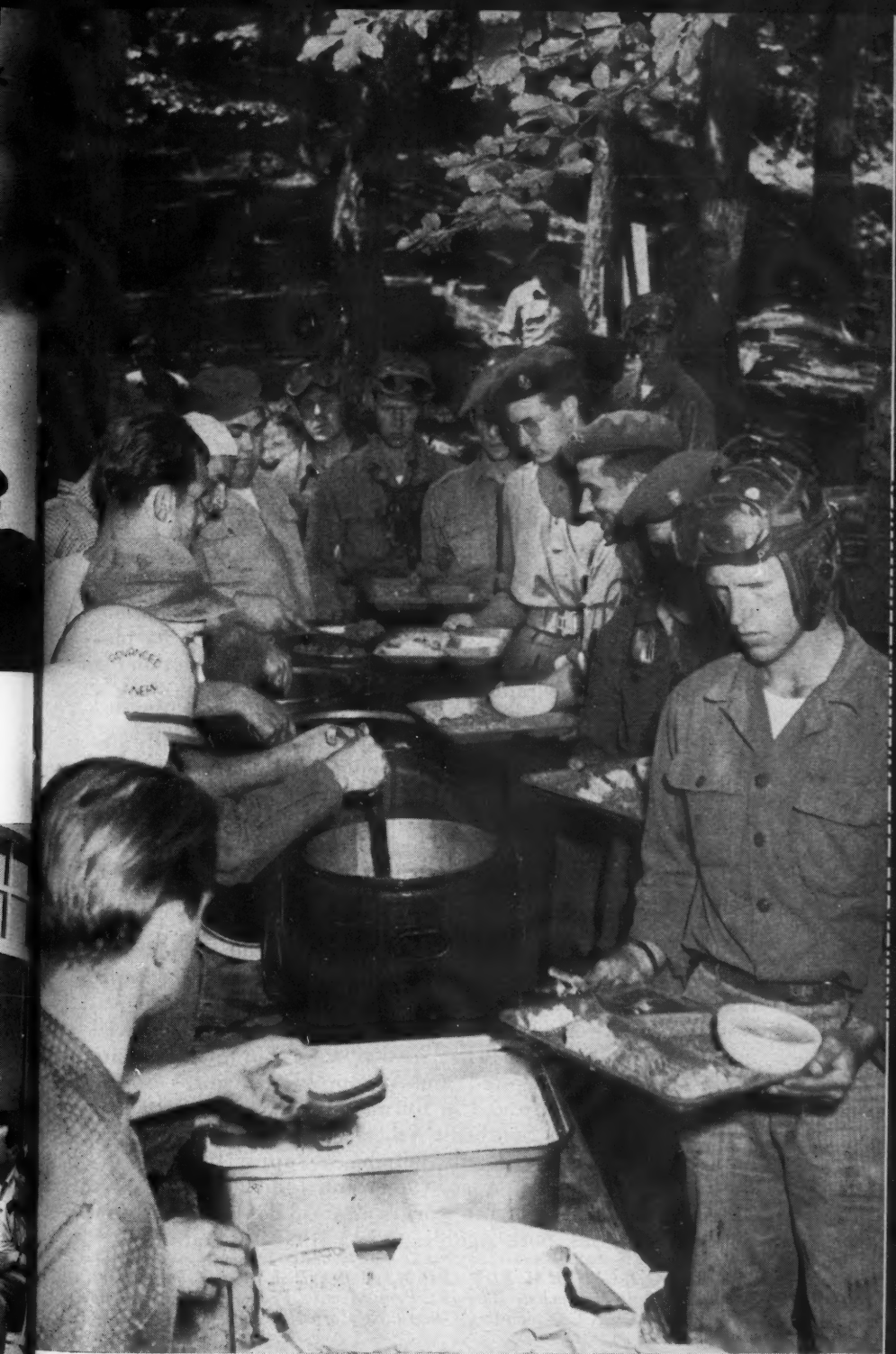


USAF Photograph

F-86 Sabre Jets wing toward an English base to bolster NATO defenses overseas. Below—A United States staff sergeant instructing Italian airmen reviews the fine points of aircraft engine maintenance.

U. S. Army Photograph





Regardless of nationality, no serviceman needs special instruction in this phase of operations. Military students from NATO countries line up for mess call while on maneuvers at Vilseck, Germany. U. S. Army Photograph

TOWARD STABILITY IN THE FAR EAST

LIEUTENANT GENERAL EDWARD M. ALMOND

WHILE world conditions today are generally confused and uncertain, the situation in some areas is not only chaotic but actually tragic. Nowhere is this more apparent than in the Far East today.

As the Nineteenth Century was the age of nationalism in the Western world, so the Twentieth Century witnesses a similar upsurge in the Far East. To many Oriental peoples this nationalistic development is merely a creed; the nature of its philosophy, if any, is uncertain. But when such creeds do not merge with Western democratic concepts the divergence becomes a dangerous factor in international relations and good will.

Many of the countries in the Far East are economically deficient, politically confused, psychologically disturbed, and some are socially degenerating and spiritually drifting. All seem to be following first one expedient or influence and then another. Large masses of Asiatic peoples are in misery and despondency, ready to follow any leadership which promises hope of betterment. Too often they follow the leadership of force rather than that of reason and logic.

Aside from China itself, now Communist dominated and boasting some seven million men engaged in military occupations, the most troubled section in the Far East is that of Southeast Asia. That region has a population of nearly three hundred million in an area somewhat smaller than Europe. Here are three Communist inspired and supported uprisings—in the Philippines, in Malaya and in Burma—and a very definite war in Indo-China. This Southeast Asian area is virtually the rice bowl of the Orient, normally helping to supply the food deficiencies that exist in Japan, China and India. Here also are produced 90 percent of the world's raw rubber and nearly 60 percent of its tin, both significant in military operations.

LIEUTENANT GENERAL EDWARD M. ALMOND, USA, is Commandant, Army War College, Carlisle Barracks, Pennsylvania. Previous to his present assignment, he was Commanding General, X Corps, in Korea.

Japan, under the occupation, has emerged as the one tranquil and renescent spot in the Orient, but Japan will need help, particularly in the international economic field. The ratification of the Japanese Peace Treaty will do much to improve both the economic and security situation there. The Soviet Union may be expected to attempt to delay and obstruct any recovery in Japan that would lead to further strengthening of friendly relations with the treaty signing nations and with India.

Communist China, as is well known, is totally dominated by the Kremlin. However, she is not an industrial power and must procure arms outside her borders. Despite administrative and economic difficulties, the Chinese Communist regime has been capable of maintaining effective control over the country at large, except for Formosa, and in addition has been able to engage in warfare on a large scale in Korea.

In Indo-China, France is expending some \$850,000,000 a year plus a large percentage of her officer corps to combat Communism and to establish democratic government. The French forces there, combined with those of the Associated States, about equal the Communist Viet Minh forces of one hundred and forty thousand. The direct cause of the situation in Indo-China is the attitude of the Viet Minh regime—headed by the Moscow-trained leader, Ho Chi Minh—which has been recognized by Red China and the USSR. Continued Viet Minh activity against Indo-China depends upon the receipt of increased arms supply from Red China.

With the defeat of Japan in World War II there occurred a power vacuum in the Far East which it was hoped that China would fill. China's rapid deterioration, however, not only failed to preserve the hoped-for stability but, during the past three years under Communist guidance, has presented the threat of Soviet domination throughout the Far East.

Deterrents to this Communist menace, organized by the democratic countries of the United Nations, have been for the most part hastily conceived and hurriedly executed. First, the United Nations deliberately recognized the Republic of Korea in 1948; then came the invasion of the southern portion of Korea by the Kremlin-dominated so-called People's Army of North Korea. Next the United Nations hurriedly acted to repel this invasion. Finally the Japanese Peace Treaty was negotiated and signed by forty-eight of the United Nations present and by Japan. This latter step, when ratified by the countries concerned, may be expected to stabilize the area of the Japanese Islands, the

Ryukyu Islands and Formosa. Stability in the Far East will be further enhanced by the newly negotiated United States security pact with Japan which permits the stationing of our troops in that country. The United States has also signed security pacts with Australia, New Zealand and the Philippines.

To be of material assistance, however, something more than lip service is needed to bring order out of chaos in the Far East. The question may well be asked: "What does a security pact in the Far East mean—and what are its implications?" Essentially it means economic and technical assistance on a mutual or reciprocal basis insofar as each signatory of the pact is able to provide such assistance. It means moral and political support including the provision of qualified civilian and military advisers in those countries which require them. And it means not only military aid but, if need be, armed assistance to repel aggression if such aggression assumes the proportion that has occurred in Korea. But such help is not the responsibility of one democratic nation. It must come from all who would destroy the threat of Communist domination.

The United Nations enforcement operations in Korea are examples of what may be needed in other instances to aid Asia. As members of the United Nations we have, in the main, done everything possible to solve by peaceful means the aggressive attempts of Communist groups or influences to intimidate existing governments throughout the Far East. The political stability and defensive capabilities of these countries form the foundation of the whole structure of freedom in the Pacific area.

In many respects, the enemy we fight in Korea today is typical of the kind of foe we may expect to encounter tomorrow anywhere in the world. The battleground there is the same type crucible as was Spain during the 1935-39 period—a testing ground for evaluating weapons and modernizing combat methods. The enemy, in Korea and elsewhere, is ruthless and insensitive to human losses. The treasure and domain that he aspires to possess is that now possessed by the democracies.

Make no mistake. The threat is plainly evident. My recent combat experiences in Korea convince me that the enemy on our future battlefields will be the most ruthless, the most cunning, the most unprincipled and the most careless of the lives of his own men, of any antagonist in modern warfare. The stakes he fights for are our homes and way of life.

Everyone agrees that our country must be protected but I am not sure that the average American appreciates how close

the danger really is. This knowledge of "what is the danger" begins in our own communities and is brought into sharp relief in battle. I have seen it manifested many times in combat.

How firm is the resolution of the young man who only six months ago was a civilian member of the community? How much mental readjustment must this young soldier make to fit himself for battle—his battle—against his ruthless Communist opponent? Actually the breadth of readjustment required is tremendous. True, there is no finer soldier in the world today than our American youth. When trained, he is superb. But no one in the world today requires more pronounced readjustment in his mental approach to the hardships of battle—particularly the ground battle. Combat today is no easier than it was in the days of Napoleon, in those of our own Civil War and in both World Wars. Today's wars are more complicated, more technical and more deadly, but man himself is the key to successful effort.

In this respect a high standard is being set by the spirit and resolution of our officers and men in combat units in Korea. Their morale is magnificent; they believe in their own great superiority over the Chinese Communists. And while they watch the cease-fire negotiations and hope for the best, they are not being lulled into a false sense of security. The following excerpt from a letter that I recently received from a regimental combat team commander in Korea is indicative: "The Eighth Army has weathered the cease-fire delays in excellent condition. I note no reluctance to close with the enemy on the part of my men. I watch carefully for this because I know we all hoped for a negotiated peace even though realistically we didn't believe it to be possible. At any rate, I feel the Eighth Army has accommodated itself to rotation and cease-fire and simultaneously has maintained its combat aggressiveness. In spite of these minor handicaps the average soldier has developed a moral superiority over the Chinese Communist and truly believes that his unit can not be defeated. I too believe that." Certainly men of this caliber are worthy of our greatest American traditions.

Throughout history fortitude, confidence and faith have helped insure the ultimate victory. The indomitable spirit displayed by our fighting men in Korea cannot help but have a salutary influence in strengthening the determination of Far Eastern nations to remain forever free.



Marines use amphibious tractors and native litter bearers to evacuate wounded from a river-front battle position.

U. S. Army Photograph

MEDICAL ADVANCES IN KOREA

MAJOR GENERAL GEORGE E. ARMSTRONG

THE primary aim of the Army Medical Service is to maintain the health and welfare of our troops and to conserve fighting manpower under conditions imposed by war. The Service must take into account the global operations of Army ground, airborne and seaborne troops, in all climates and in all environments from jungles, deserts and mountains to ice-covered Arctic wastelands. It must be prepared for hazards which are new to military experience, notably in the fields of atomic, chemical, biological and radiological warfare.

The Service must also anticipate problems which are foreign to our normal American medical experience and interest, for our troops are heir not only to all of our diseases here but to a great many which they will meet for the first time in foreign lands. We must recognize that the primitive conditions of combat cannot provide the safe and sanitary environment in which we normally live. We must gauge man's capacity to endure the severe stresses to which the fighting soldier is exposed and his limitations which are incident to operating the complex modern machines of war.

Many pressing problems have been raised by our two years of operations in Korea. Certainly, this is one of the more primitive areas of the world with respect to sanitation and the devastations of war have only intensified the situation. The threat of intestinal diseases is everywhere, notably the bacillary and amoebic dysenteries, typhoid and paratyphoid fevers, and a wide variety of intestinal parasites. Cholera may become a threat at any time. Diseases against which our troops have little immunity are common there, notably malaria, hepatitis, Japanese B encephalitis (sleeping sickness), typhus fever and leptospirosis. Plague is an ever possible threat in the Orient. And recently we encountered a little known disease, epidemic hemorrhagic fever.

MAJOR GENERAL GEORGE E. ARMSTRONG is The Surgeon General, United States Army.

The rugged mountainous terrain, with its few and primitive roads, has presented staggering problems in the rescue and evacuation of wounded. Moreover, the climate of Korea is one of extremes, with a hot humid summer, a miserably uncomfortable rainy season, and a bitterly cold winter. Each extreme presents its special problems in the protection of troops and in the handling of casualties.

Our non-battle accident rates in Korea frequently have exceeded our battle casualty rates, due primarily to the high degree of mechanization of our forces, the primitive road system and the rough terrain. Moreover, because our forces generally have been outnumbered, we have heretofore had to keep our troops in the line much longer than we have wished. The strain of continuous combat, combined with the anxiety and tensions of infiltrations and night attacks, have generated important psychological and psychiatric problems.

What influence has the Army medical program had on the situation in Korea? First, the incidence of intestinal diseases among our troops has been remarkably low, but among enemy prisoners and the refugee population these ailments have been common and with a fairly high mortality rate. The major reason for this striking difference is the maintenance of good discipline and sanitation by field commanders in trying circumstances.

Two contributions from the research program have also helped. The Quartermaster Corps, with the aid of our nutrition research, has developed field rations which are much improved over those of World War II. This not only has maintained our combat troops in a good state of nutrition but the high acceptability of the new rations has largely eliminated the temptation to break dietary discipline and eat unsanitary native foods.

The second factor is the provision of individual water sterilization tablets to combat troops. Halazone tablets were introduced first in World War II and are still used extensively in Korea. A new item now being introduced is an iodine compound, tetraglycine hydroperiodide, which is much more effective in destroying the cysts of amoebic dysentery in water. Tests of this compound by an isolated garrison on a Pacific Island over many months have proved it to be harmless and efficient.

The enormous incidence of bacillary and amoebic dysentery in prisoners of war has facilitated the study of these important diseases. Jointly with the Navy and the Armed Forces Epidemiological Board, Army medical specialists introduced new methods in treating more than twenty-two hundred cases of

bacillary dysentery and more than one thousand cases of amoebic dysentery. The results are amazing and represent more progress in the last six months than might have been anticipated in this country in many years.

Considerable progress has been made against malaria. Chloroquine received its first real trial in the Korean campaign, where it has been almost completely successful in suppressing malaria in combat troops. It need be taken only once a week and causes none of the annoying side effects of quinine and atabrine. Like quinine and atabrine, however, it is suppressive only for vivax malaria and, as anticipated, many relapses occur when the drug is stopped.

About a year ago, with the aid of the National Research Council, we mapped plans which we hoped would lead to the development and adoption of a truly curative drug for vivax malaria. The field was narrowed to three possible drugs, of which primaquine appeared to be the best answer. But that had not been given to enough men to be sure of its safety. To obtain this information, we tested primaquine daily for fourteen days on one thousand normal volunteers at Fort Knox, Kentucky, and Fort Benning, Georgia, and found that it caused no toxic symptoms.

It now appeared possible to use primaquine to prevent malaria relapses in returnees from Korea, but we could find only one spot where they could be treated in groups for fourteen days. This was aboard the transport ships on their return voyage across the Pacific. We then had to be certain that it was practical to administer the drug to large numbers of troops aboard transports and that it caused no more symptoms at sea than on land. To test this, a research team flew to Japan and conducted an experimental study on two returning ships. The drug caused no symptoms among twenty-seven hundred returnees and it could be given successfully aboard ship.

In October 1951 the data were presented to the National Research Council and the Armed Forces Medical Services. Before the month was out, the policy of giving primaquine to all returnees from Korea had been approved and is being adopted as quickly as an adequate amount of the drug can be procured. We now plan to distribute it to all of our medical installations for treatment of malaria.

Our work on the cure of scrub typhus fever with chloromycetin is well known but the problem of prevention is not solved. More recently, we have shown that chloromycetin is the first cure for typhoid fever ever discovered.

It is regrettable that our vaccine for Japanese B encephalitis, hastily developed to meet the Korean threat, has not been successful in treating troops, although there appears to be evidence that it was of some value in treating Japanese children. We have made a significant advance in another direction, however, which may lead to some control of this disease. When United Nations troops first went into Korea, the manner of transmission and spread of this disease was a complete mystery. Within the past few months we have discovered that it is spread by the bite of the *Culex tritaeniorhynchus* mosquito. Adequate insect control may eradicate this disease around fixed military installations but such controls cannot be applied successfully over wide areas of active combat.

Marked improvements have been made in the diagnosis, nutrition and clinical management of hepatitis cases. But we still do not know a practical way to prevent its spread in troops and we have no specific curative treatment. Studies are being conducted in Germany and, more recently, in the Far East where the incidence of hepatitis is high. We hope in the next year to reduce sharply but safely the long hospitalization time now necessary for these cases.



South Korean litter bearers move a battle casualty from a forward aid station to a waiting helicopter.

U. S. Navy Photograph

The chances of a wounded man in Korea dying of his wounds, once he reaches a battalion aid station, are only half those of World War II. A number of factors have contributed to this favorable record.

The development of Mobile Army Surgical Hospitals has brought superb surgery close to the front lines. This places the severely wounded in expert surgical hands very quickly. The development of air evacuation, principally by the Air Force, now includes the use of helicopters right up to the front lines. It cuts hours to days from the time required to get a severely wounded patient to specialized medical care and often spares him a long and wearing ride over rough roads.

The use of plasma on the battlefield and in the aid stations, and of whole blood down to the divisional medical services, has done more than anything else to prevent or relieve that great killer of the severely wounded—shock. Modern antibiotics help to prevent gas gangrene and wound infections and have made the early closure of wounds and abdominal surgery more successful. Better methods for clinical management of the dangerously ill patient in the field have further improved the chances of the severely wounded man. We are actively continuing work on traumatic surgery, wound infections, shock, preservation of blood, sterilization of plasma and improvements in equipment.

Our work on methadone and l-isomethadone, including extensive clinical testing in civilian and military hospitals and on the Hungnam beachhead in Korea, has shown these to be adequate substitutes for morphine. We are now studying synthetic substitutes for codeine which, if successful, may enable us to reduce sharply our imports of opium.

We have been working intensively on frostbite since last fall, both in the United States and in the Far East. Sizeable medical teams are in both Korea and Japan, fully equipped to study and treat all cases of cold injury.

In surgery, we now have developed the intramedullary pin to the point of practical application for selected fractures of the thigh and lower leg. With this method, a strong stainless steel pin is driven lengthwise along the marrow cavity, in the center of the broken bone. It holds the broken ends firmly in place and no casts or splints are required. The patient can begin exercises in bed almost immediately and he can be up and walking weeks sooner than under former types of treatment. He does not have atrophied muscles and stiffened joints to overcome. This method has been used on a number of Korean casualties.

We have developed and standardized a unique dressing for burns; it consists of an inner layer of surgical gauze, then one-half inch of absorbent cotton, then fifteen layers of cellulose paper, then an outer layer of tough paper. In trials in Korea, it proved so useful for large or multiple wounds that its designation has been changed from "burn dressing" to "universal protective dressing." These dressings are now in procurement for use in the Far East.

While the death rate among the wounded in the hands of the Army Medical Service is now down to $2\frac{1}{2}$ percent, the same drastic reduction of death rates does not extend to the battlefield. Here the death rate is still some 20 percent or more, only slightly lower than in World Wars I and II. In an effort to determine whether there was any chance of reducing the battlefield death rate, we sent a team to Korea last summer to conduct a missile casualty survey. This team studied forty-six hundred cases of killed and wounded in four months and came back with some extremely valuable information.

Their data and statistics at once revolutionized our concepts on the feasibility of body armor. We formerly believed that body armor was too bulky and heavy to be worn by combat troops. This report indicated that much lighter armor, protecting the vulnerable spots, should greatly reduce the death rates.

The team joined forces at once with the Quartermaster, Ordnance and Chemical Corps of the Army, and the Medical Service of the Navy, and pooled all information on body armor. Within two months they had produced fifty suits of body armor of technically valid design and were en route to Korea to test it. There our belief that it is wearable and highly acceptable by combat troops of all arms was quickly confirmed. Based upon that experience, the Quartermaster Corps has designed combat body armor which we, in collaboration with the Navy, hope to test on a substantial scale in Korea. If successful, it should produce a substantial reduction in battlefield deaths.

Thus in the field of medical research and development we march along a road without end. But we do so willingly and with full knowledge that success begets failure which in turn begets success. Always the goal remains before us—to maintain the health of our troops and to conserve fighting manpower under all conditions.

LONG-RANGE STRATEGY FOR A LASTING PEACE

GENERAL OF THE ARMY OMAR N. BRADLEY

WE AMERICANS now find ourselves in a position of world leadership. It is a position of great influence from which we can decide almost every important international question except the alternative of peace or war.

Although we can influence the decision toward peace rather than for enlarged conflict, we may have war that is decided upon by other men in other governments behind the Iron Curtain. We must therefore prepare a military program, within our means, fashioned to meet either alternative.

The more I work on our plans for defense, the more I am convinced that a total war is not inevitable and that our defense plans—and the great effort we are making in Korea at such a large sacrifice—can be part of a long-range strategy for a lasting peace.

In our position of leadership we must face certain international facts of life and we must work within a military orbit to which this Nation and its allies are already committed. There are three factors beyond our control and in which we have no choice.

First, the enemy shows little prospect of changing. It will be the same evil face, peering over the same Iron Curtain, with the same evil designs on the freedom of the world.

Second, there is little hope that the nature of our enemy or his methods will become less tiresome, less expensive to combat or less aggressive. The Cold War will still be with us, perhaps spread a little wider, dug in a little deeper and at a lower temperature. The Soviet Union has added to the Cold War a new technique—war by satellite. We can anticipate aggression wherever he believes the timing and the ultimate result are in his favor.

Third, any negotiations are going to be as long-drawn, as

From an address before the Junior Chamber of Commerce, Pasadena, California.

complex, as difficult and as interminable as he can make them, either inside or outside the United Nations. We have learned that negotiating with Communists, and especially the Soviet Union, requires all the patience that free men can muster.

On the other hand, we do have certain credit in the military bank. We have staunch and true allies with common ideals of freedom. We are members of the finest collective security program the world has ever known—the North Atlantic Treaty—designed for peace and getting stronger every day.

The American people have underwritten two of the most generous and most productive international programs in all history—the Marshall plan and the military aid program, now combined into the Mutual Security Agency. The money we are spending is a premium on an insurance policy that will pay off in case of war; and it pays peace dividends every day.

Moreover, the United States is fundamentally the strongest nation in the world. Economically, politically and spiritually the American people are closely united, living under a free system of government which is the most contagious idea since the start of Christianity.

The military outlook must include the fact that the American people have several major international commitments. In each one of them, we have passed the point of no return. There is no turning back.

Our most important and our heaviest military burden is not across the Atlantic or the Pacific; it is at home. Our own mobilization is our highest-priced investment in peace—whether we measure by dollars, materials or manpower. Defense of the North American continent is the top-priority task; it is the arsenal and the hope of the free world. But the security of America is *not* separate from the security of other free men.

When Korea gave us the third alarm in this international fire call, we had to make a basic military and economic decision—to what extent should we mobilize? We had three choices: total mobilization of all our resources, assuming an early all-out war with the Soviet Union; or no mobilization at all, allowing Communism to take whatever she wanted whenever she wanted it; or a middle course somewhere between these two extremes.

We chose the middle course of mobilizing the forces we needed for the conflict in Korea and then setting the throttle at a steady speed. The American people wanted to have both television and tactical A-bombs, automobiles and ammunition.

Total mobilization would have caused large-scale industrial disruption and would have put us through the cycle of unemployment, peak employment with its inefficiencies and, finally, when we were completely ready, back into more unemployment.

The middle course has disrupted industry as little as possible. It did not bring on the violent economic spasms of complete industrial change-over to war. The proof of whether this course was the right one or not will come in the next few years. If our middle course gives us sufficient military strength to deter further aggression we have saved ourselves billions of dollars and spared ourselves the unnecessary upsetting of our economy.

In the next few years, our country can shift the throttle forward and increase our present effort to a total mobilization of our defenses. Or we can maintain the steady pace that we have set for ourselves and continue to build our readiness on an ever-increasing curve. Or we can abandon all that we have accomplished, reverting to the policy we have too often followed in the past of wastefully "buying it and scrapping it."

If we do the latter, the Mutual Security Program will collapse and the readiness of our allies will be put off for a long time to come. In the face of such a prospect—and the terrible risk it involves—we would probably lose them. Through our own weakness we would probably invite further aggression. It would only be a matter of time until the Iron Curtain would drop with a splash in the English Channel and the Bamboo Curtain would roll down around all of Asia.

The key to our military policy is sustained effort. Our own mobilization effort, plus our collective security alliance and the military aid program for our friends, is the least expensive method by which we can hope to deter aggression. Also, the combination of these efforts is the least expensive method by which we can conduct the Cold War.

The United States is committed by treaty for another seventeen years to a collective security effort with our thirteen allies in the North Atlantic community. Already, military miracles have been accomplished. In less than three years these nations have pooled part of their sovereignties and created combined plans of defense which are interdependent. Never before have military resources on such a scale been combined so wholeheartedly in times of peace.

If Americans choose to look at this selfishly, they can rightfully say that the North Atlantic Treaty Organization would

be a military shell without the strong central support of the United States. But no American can say that we have any more at stake in this agreement than the smallest nation, for the countries in Europe are on the firing line and directly under the gun of any Communist attack. They are being pounded and pressured every day and still they stand resolutely with us.

When we sent additional divisions and planes to Europe last year, we gave our North Atlantic Treaty partners physical evidence of our faith in them and our determination in this task. There was never any consideration in our agreements and plans with these other nations, that now or in the future we would adopt any principle or practice which would abandon them to being overrun, with a promise of later liberation.

Because Americans prefer quick and easy solutions to difficult problems, we are very vulnerable to any theory of defense which catches our imagination. It is the will-o'-the-wisp call of air and sea power projected from this hemisphere, which is a military concept popularly known as the "Gibraltar theory." This concept unbalances our strength by placing reliance mainly on our Navy and our Air Force. It contemplates the withdrawal of our ground forces from the continent of Europe to our own North American "Gibraltar."

This concept is unsound for several reasons. It would leave our friends in Europe to face aggression at their borders while we bombed the enemy from afar. If we were to adopt any such military policy or practice, we would soon find ourselves without allies and going it alone. Other North Atlantic Treaty Organization members would rightfully consider that we had broken our word.

Air power is the mighty weapon of the Twentieth Century. Coupled with the atomic bomb it is the most violent weapon of retaliation and attack that the world has known. At the moment, our allies in the North Atlantic Treaty Organization have largely entrusted their chances for a continued peace to this American-owned deterrent to aggression. But all know that air power and the A-bomb are not enough.

There are many military targets against which an atomic bomb would be ineffective or wastefully applied. If any enemy wanted to disperse his forces so that soldiers walked one hundred yards apart, they could march across Europe tomorrow in the face of the greatest atomic power on earth—unless other soldiers were there to stop them. However, once we have the means to make an enemy concentrate his forces, there are many

methods available to destroy his military offensive power. In the event of war, Americans will have to fight on the ground three thousand miles from home if we are to provide ultimate protection to New York, St. Louis and Pasadena.

Some prefer the dramatic vision of American power sitting securely in the Gibraltar-nest of the North American continent, with our eagles flying out to defend the nest and to attack the enemy if war should occur. This Gibraltar concept is a selfish and a defensive one. The American spirit would tire of it right after the first atomic bomb dropped on an American city. Our chagrin and our shame would be unbounded if we saw the enemy making slave camps out of Paris, Brussels and Berlin.

It is not in the American nature to invite war by backing away from a difficult situation. Our greatest chance for peace in Western Europe and the world—and our greatest hope for the security of the United States—lies in continuing steadfastly and strongly our collective efforts in a forward strategy against the Iron Curtain. This does not mean that Americans advocate a preventive total war. There is no such thing. For we would be in the war that we are trying to prevent.

The top-priority problem on our military docket—the war in Korea—has been tough from the very beginning. Despite the military odds against us, no decision, at the time it was taken, had such complete support from the American people as our decision to oppose the outright aggression in Korea. But militarily, it has been an uphill fight all the way.

Our Nation and its Armed Forces have a long and successful history of tackling every problem directly. We pitch in, appropriate enough money, build enough equipment or weapons and slug it out for enough rounds to win a decision. We usually start our military operations when we have built up our strength and are ready to launch an offensive. But in Korea we were in the scrap before we were militarily ready. We started with less than an infantry battalion when the South Koreans had their backs to the wall. We opened up on the defensive.

When we have to fight, we Americans like to fight on a big scale, with plenty of elbow room. However, because we did not want to enlarge the war unnecessarily by bombing in Manchuria, we have tried to fight the war in a limited area. The decision not to extend the bombing to Manchuria and China was taken after long and careful thought. It was felt that the results would not be decisive; that such attacks might incite hostile bombing behind our lines or might bring on a general

war. It has given some a feeling of frustration that we have withheld part of our air power. Americans felt like a fighter who does not really have enough room to swing. We have withheld what people consider our "Sunday punch"—the atomic bomb—because strategic bombing to be effective must be aimed at the source of supply. And we all know that the main source of Communist supply is not in China.

There is no guarantee that air power in any of its dimensions would be decisive. An air attack by the United Nations on China might possibly trade the small deadlock in Korea for a larger stalemate in China. Even with our war limited to Korea, however, we proved to the enemy that his aggression was not successful. So they offered to sit down and talk truce. General Ridgway has conducted these trying negotiations with the Communists with as much patience as a man can humanly be expected to have. He has proved his statesmanship to be as great as his leadership. He deserves our respect and gratitude.

No summary of the military outlook would be complete without facing the inevitable question—If the Soviet Union and her satellites really have the intention of conquering the free world, why haven't they attacked before this? Actually, they have attacked and are attacking every day by any means they consider advantageous. In the Cold War, they have taken advantage of our free press, free speech and free economy. They have used our freedoms, and our support of freedoms, as modes of attack to spread the Communist line.

The Communist directors have used the technique of war by satellite in Korea. If it is allowed to become a successful method, they may be encouraged to try more of it. They have not started an all-out war. Maybe it is because of our atomic stockpile and our air power and because they have watched the rehabilitation of the peoples in Western Europe.

We do not know what the Soviet imperialist intend to do. But from a military viewpoint, I believe that if we continue to work for collective security arrangements that help our allies to help themselves, we will continue to deter the aggressive designs of the enemy. Our moves are morally right, politically and economically feasible, and spiritually well founded.

Today we have positive programs for security. We have a sound military policy that has taken the initiative for peace as a deterrent to war,

LABORATORY FOR THE FLEET

CAPTAIN FRED W. WALTON

SUBMARINES that cruise silently beneath the surface of the sea, a distilling unit to make salt water purer than that used for human consumption, quick-acting water pumps for fighting shipboard fires, a destroyer's gear capable of withstanding the concussion of a bomber's near miss—these and other engineering projects have been under development at the United States Naval Engineering Experiment Station to add to the Navy's fighting efficiency.

"Service to the Fleet" might well be the motto of the Experiment Station across the Severn River from the Naval Academy at Annapolis. Its mission is to insure that the Navy is furnished with the best machinery, equipment, materials and propulsion plants.

Since it was established in 1904, the Station has played an important role in the elimination of engineering problems aboard the Navy's ships. All the parts and devices which make up a vessel's machinery plant (except main turbines and boilers) are tested and evaluated here to weed out potential defects before they are procured in quantity. Many of the special testing devices are designed and built on the spot.

Scientists at the Station study methods of improving existing naval machinery and materials; they develop special engineering equipment to meet the needs of new naval construction; and they work out procedures for testing various types of devices, equipment and materials. Their findings form the basis for Navy procurement specifications.

Work at the installation is conducted in six major laboratories—Mechanical, Wave Mechanics, Metallurgical, Chemical, Welding and Electrical, Internal Combustion. A laboratory for underwater propulsion studies is under construction.

The Mechanical Laboratory tests machinery and auxiliary

CAPTAIN FRED W. WALTON, USN, is Commanding Officer and Director, Naval Engineering Experiment Station, Annapolis, Maryland.

equipment, gas turbine plants, refrigeration equipment, evaporators, air compressors, pumps and other mechanical gear for serviceability at sea. Typical of its activities are the changes made in a distilling apparatus for extracting drinking water from salt water. Although the commercial unit undergoing test was found to be of good design, it was not suitable for use on submarines where batteries require water of even greater purity than that used for drinking purposes. The Station engineers therefore recommended design changes which were accepted by the manufacturer. The unit was installed in all submarines of the United States Navy during World War II and later was adapted for use aboard surface ships.

Currently being put through the paces is a portable gas turbine-driven pump for combatting fires aboard ships at sea. War-time *Kamikaze* attacks demonstrated the need for reliable, portable pumps to fight fires when the ship's main water and chemical lines were damaged. Industry was requested to develop a low horsepower gas turbine-powered pump which could be started by hand. The result is a light, easy to maintain unit using Diesel fuel which is less flammable than gasoline.

The Wave Mechanics Laboratory is mainly concerned with making naval vessels quieter—a project increasingly significant in submarine warfare because of its importance in helping underwater craft to escape detection. A special building housing three echo-absorbing chambers—each large enough to accommodate full-scale shipboard machinery—is used in studies of acoustics, vibration and sound detection.

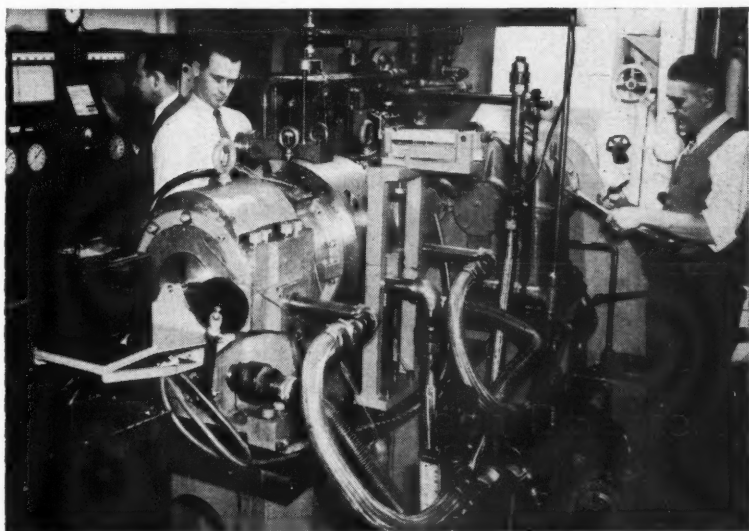
Laboratory workers are currently testing submarine Diesel engines, pumps, blowers, electrical machinery and other auxiliary equipment to seek out and eliminate causes of noise. Various methods of isolating whirring, vibrating machinery from the hull (to prevent sound from being transmitted to the surrounding water) are also being studied. A full size submarine hull is used for this purpose.

World War II naval engagements revealed the vulnerability of shipboard machinery and equipment to concussion and shock, emphasizing the necessity for shock resistant types. One of the Laboratory tests is designed to determine the ability of equipment to withstand shocks from the ship's own guns, from depth charges, torpedoes, mines and bombs. As part of this test, a one and one-half ton hammer strikes the underside of a two-ton anvil table upon which electrical, mechanical, electronic and electro-mechanical items are placed. This severe shock

test enables engineers to anticipate possible damage under combat conditions and frequently leads to recommended changes in designs and materials.

The Metallurgical Laboratory investigates the characteristics of various metals and alloys under extremes of temperature and stress. The theory of fatigue and corrosion-fatigue of metals, which is today a basic factor in structural and mechanical design, was originated at the laboratory. As part of a continuing study, metal parts which fail in service are sent here for analysis. Here, too, research is carried on in corrosion resistant substances. Development of substitutes to conserve critical materials is also receiving emphasis.

The Chemical Engineering Laboratory, among other projects, is currently studying methods of preserving materials and equipment packaged for shipment to overseas bases. It has developed a new joint-service specification for a dehumidifying compound which provides maximum protection at minimum cost. Its research in the field of rust prevention proved invaluable in the post-war "mothballing" of the Reserve Fleet. Current efforts are aimed at developing a thin film rust preventive that can be removed easily and a protective coating to shield already rusted surfaces from further corrosion.



This machine to test bearings is used in laboratory studies leading to the design of more efficient propulsion equipment.

U. S. Navy Photograph

Among the products under study are boiler water compounds, anti-freeze preparations, mechanical packings, thermal insulation, adhesives, dehumidifiers, polishes and a host of other items. The potentialities of a small industrial gas generating plant are being investigated. If the device proves satisfactory, oxygen for aviators, carbon dioxide for fire extinguishers, acetylene for cutting and welding, and nitrogen for fuel lines may be manufactured aboard ship or at advance bases.

The Welding and Electrical Laboratory develops procedures and equipment for the fabrication of naval materiel by welding and brazing. The weldability of high-grade steel, titanium and certain alloys are now being tested. Underwater cutting and welding methods used extensively in World War II salvage and repair operations were originally developed at the Station.

The electrical branch is concerned with the improvement of shipboard interior communications, fire control and rotating electrical equipment. It also carries on radio interference research to reduce static caused by mechanical and electronic devices. Sound-powered telephones, switchboard components, alarm bells, fire and vapor detecting devices, salinity indicators, speed logs, engine telegraphs and other indicating and monitoring devices are also evaluated here and modified if necessary. Based on these findings, the Navy Department's Bureau of Ships drafts revised specifications for various types of equipment.

The Internal Combustion Engine Laboratory encompasses the largest Diesel engine laboratory test space in the world. Engines, generator sets and auxiliaries designed for naval craft are tested to determine their suitability for naval service. Adaptation of the snorkel system to American submarine engines was largely accomplished in this laboratory.

All types of engine components and accessories—including marine reverse and reduction gears, fuel injectors and fuel injector pumps, heat exchanges, cooling systems and filters—are developed and tested at the laboratory. When some aircraft engine failures during take-offs were traced to contamination of gasoline by water or solid materials, the Navy Department's Bureau of Ships and Bureau of Aeronautics co-sponsored an investigation of aviation gasoline filter separators. As a result, improved filters were placed in use.

Various foreign types of Diesel engines are analyzed and proof tested in the laboratory to discover any points of superiority over American engines. Information thus gained is made available to American engine manufacturers.

Constant change in design of propulsion equipment has required parallel developments in fuels and lubricants. Evaluation of these developments is carried on in a special Fuels and Lubricants Project. Studies range from test tube analysis to actual use in full-scale equipment. High quality lubricating oils are being tested in submarine engines to improve snorkel operation and to mitigate the effects of high sulphur content Diesel fuel. Tests of new fuels for marine gas turbines and of new lubricants for the latest types of marine reduction gears are also in progress. Studies to improve lubricants for arctic operations are under way, with all research being co-ordinated with engine manufacturers and lubricating oil suppliers.

Since every piece of rotating and reciprocating machinery ultimately depends upon bearing performance, research on bearings is a natural corollary of the other work of the Station. Beginning in 1946 a Bearings Project was established to co-ordinate as well as carry out research in this field. The present program emphasizes noise reduction, space and weight saving and studies of materials to conserve strategic stocks. The equipment available makes the Station one of the most diversified and complete installations for such research in the Nation.

The Naval Engineering Experiment Station operates under the military control of the Severn River Naval Command and under the technical control of the Bureau of Ships. Technical work is performed by civilian specialists. Naval officers serve in an administrative capacity and frequently furnish essential guidance based on their knowledge of operating problems at sea.

The final results of the Station's investigations are submitted as written reports to the Bureau of Ships. These reports contain performance data, recommendations for approval or disapproval of the equipment or materials for Fleet service and a discussion of the broader aspects of the studies. Recommendations are frequently supplemented by suggested modifications or re-design of equipment or substitution of materials to improve performance. In contributing to development of performance specifications, the Station serves the Fleet as an engineering referee and influences industry in producing improved shipboard equipment.

Its modern facilities for wide-ranging research make the Naval Engineering Experiment Station, in effect, the Navy's proving ground for determining the most practical and effective engineering developments for our forces afloat.



The L-23, which carries a pilot and five passengers, can also be used for transporting cargo.

Beech Aircraft Corporation Photograph



The L-17 is used extensively for combat observation missions in the Korean battle zone.

U. S. Army Photograph

AIRCRAFT FOR THE ARMY

MAJOR G. W. KILMER

THE division plan of attack is decided. Immediately orders, overlays and maps are sped to subordinate and supporting units. Engineer troops are alerted to bridge a stream for the advance. Artillery pieces are readied to blast enemy positions before and after the infantrymen and tankers push forward. At every step in planning and execution of the operation, Army aviation plays an important role.

Just as the advent of the airplane has injected a third dimension into strategic and tactical warfare on land and sea, organic aviation today is assisting Army commanders to perform by air many functions formerly conducted by slower ground methods. The combat commander frequently makes his reconnaissance in a light plane or helicopter. He maintains better control of his units through fast communication by air. Liaison with adjacent troops is speeded and delivery of bulky maps and highly essential cargo is expedited by light planes and helicopters.

The use of aircraft is not new in the Army but many persons, including servicemen, are still unfamiliar with the mission, aims and employment of Army aviation by ground forces. Primarily Army aviation has an integral, organic function without being a separate branch or corps. Aircraft are assigned to combat and service elements—just as are trucks or bulldozers—according to requirements. Today they may be found as Table of Organization equipment in Infantry, Armor, Artillery, Corps of Engineers, Signal Corps, Transportation Corps and Ordnance Corps. Field medical units are being added to the list of organizations employing airplanes in combat areas.

Organic aircraft have been integrated throughout the Army structure wherever their use can be fully justified in assisting units of the arms or services to perform their assigned missions. Reports from Korea indicate that virtually 70 percent of all artillery fire missions are now adjusted by air observation. Regimental commanders there are high in their praise of this

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method. Availability of aircraft within the unit precludes the necessity for requesting reconnaissance, observation, courier or other missions from higher headquarters.

During the first eighteen months of combat in Korea, Army aircraft made 64,541 combat flights and carried out 76,251 administrative missions, amassing a total of 186,372 hours in the air. Only ten planes were lost due to enemy action while nine pilots were killed and ten wounded. Three aerial observers were killed and eight others wounded.

Four major types of aircraft are now in use by the Army. Two are conventional fixed wing propeller types, divided into two-place and multi-place categories. Two are helicopters, including utility and cargo machines. The two-place aircraft carry one passenger besides the pilot while the multi-place types carry a pilot and two to six passengers.

Both fixed wing and helicopter types are assigned to divisions as well as to non-divisional units. An infantry division will, in the near future, be assigned thirteen two-place and three multi-place fixed wing planes. In addition ten utility helicopters will be assigned to a division. Fixed-wing and helicopter type aircraft are utilized also in army and corps headquarters, engineer groups, separate infantry regiments, field artillery battalions, signal battalions, armored regiment headquarters companies and reconnaissance battalions, ordnance aircraft maintenance companies, medical air evacuation units and transportation helicopter companies.

In Korea organic aircraft in infantry divisions are kept busy providing command and staff reconnaissance, emergency resupply, and transportation between higher and lower headquarters. Helicopters of the signal company furnish rapid courier service, reconnaissance for wire routes, transportation of communication equipment to inaccessible points and re-supply. In a signal battalion in the combat area, one airplane took the place of twenty jeeps used in messenger service. (See "World's Biggest Little Airline," November 1951 DIGEST.)

The engineer battalion of a division uses its helicopter for reconnaissance of roads, bridges and streams to determine the materials and labor required for construction. Fordings or stream-crossing points also are more easily selected by this means. Topographical engineer units employ their assigned aircraft for surveying operations, using them to select triangulation points and to transport survey parties to inaccessible locations.

Aviation organic to infantry regiments is used extensively for

reconnaissance and observation missions. One regimental commander in Korea stated that a pilot aloft was worth six officers on the ground in reporting the progress of an attack. Because his airplane operated from an airstrip near his command post and could communicate with any of the ground elements, he could deploy units of his command rapidly to meet hostile threats or to exploit weak points in the enemy defenses.

Field Artillery was the first branch of the Army to use aircraft. Since 1942 the Artillery has utilized its aircraft to create air observation posts for more accurate and rapid adjustment of fire missions. Aircraft in constant demand for such purposes are an integral part of the Artillery fire control system.

Aircraft at corps and army headquarters are used for reconnaissance, transportation and liaison for commanders and staffs, a mission formerly undertaken by the Air Force. Swift communication between the commander and his ground units has proved especially valuable in Korea where existing roads are poor and passable roads are few and far between.

Aircraft in armor units are required for reconnaissance, observation and control. During World War II the craft were frequently assigned flank security patrol missions for tank columns thereby freeing ground elements for other tasks.

Ordnance Aircraft Maintenance Companies use light planes for rapid battlefield recovery and repair of downed aircraft and to rush needed parts and supplies to units in the field.

Transportation Helicopter Companies provide air transport of men and supplies over short distances; they expedite tactical operations and give logistical support to units in forward areas. Use of these units is expected to reduce the number of Transportation Truck Companies which ordinarily perform such tasks.

Helicopters assigned to Mobile Army Surgical Hospitals are proving extremely effective in the evacuation of wounded in Korea. Medical Air Evacuation units are expected to replace ground ambulances to a considerable extent.

Because of the diversified uses to which the Army puts its aviation, it was obvious from the outset that several types of aircraft would be required—each designed for its own peculiar mission. Such aircraft must be small, light in weight, reasonably well powered and easy to maintain and repair. The Cub or L-4 was adopted in 1942 because it was the best available airplane that met Field Artillery requirements. As the type of missions changed or expanded, other types including the helicopter were tested and placed in use. With the co-operation of the Navy,



The H-19 helicopter carries eight to ten passengers and the pilot. It is frequently used to evacuate the wounded.

USAF Photograph



A recent model H-23 helicopter of Eighth Army Air Section prepares to take off on an observation flight.

U. S. Army Photograph

the Air Force and the aviation industry, the Army conducted an extensive program to improve its planes.

Several types of planes are now in use within the four main categories. The L-19 two-place, all-metal fixed wing airplane is fast becoming the workhorse of Army planes and has replaced the L-4, L-5, L-13 and the L-16 types previously in use. Nick-named the Birdog, it is highly suited for small or unimproved airstrips. Its many uses include artillery fire adjustment, reconnaissance, observation, re-supply, wire laying, column control, evacuation of walking wounded and courier service.

In the multi-place fixed wing category, four planes are now in use. The L-20—known as the Beaver—is the all-metal, high-wing light cargo aircraft popular in the wilds of Alaska and Canada. Besides the pilot it carries six passengers or two litter patients and attendants, or sixteen hundred pounds of cargo.

The L-17 is an all-metal, low-wing craft which can accommodate a pilot and three passengers or the equivalent load in cargo. This plane is being replaced by the L-20 and the LC-126. The latter is fully equipped for instrument flight, is all metal and has a sturdy engine—all added safety features for flying from unimproved fields. Besides being used for light cargo, courier service and transportation, it serves as an instrument trainer plane for students.

The L-23 is a twin-engine long-range aircraft carrying a pilot and five passengers or equivalent cargo.

In the utility helicopter category, the H-13E carries a pilot and a passenger in the cockpit and can carry two patients in litters enclosed in pods attached to the fuselage. It is widely used in the evacuation of wounded, for reconnaissance and observation, wire laying and re-supply, courier service and transportation of ground commanders.

The H-23 is a relatively small, lightweight helicopter capable of carrying two litter patients in addition to the pilot.

In the cargo helicopter field the H-21, often called the Flying Banana, is under procurement. It is powered by two rotors and will carry a two-ton payload or a pilot and twenty troops. The H-19, a number of which have already been delivered to the Army, is a single-rotor helicopter that can transport eight to ten passengers and the pilot. It is useful in all types of combat operations for such jobs as evacuation, re-supply, light cargo and troop carrying.

All aircraft for the Army are procured by the Air Force at Army request. Upon delivery by the manufacturers to the Air

Force, they are withdrawn from depot stock by the Ordnance Corps for distribution to Army activities. In actual practice, however, the "withdrawal" is accomplished only on paper. Normally the aircraft are flown by Army pilots from the factory to the units that are to receive the equipment. First echelon repair of Army aircraft is carried out at the unit level. Ordnance units are responsible for field maintenance, repair and parts (except at depot level where the Air Force retains responsibility).

Army aviators are primarily officers of their basic branch and only secondarily pilots. Officers under thirty years of age, no higher in grade than first lieutenant, may volunteer for pilot training. Such officers must be assigned to one of the branches utilizing Army aviation or must be willing to accept detail to one of them. They must meet prescribed physical standards.

Officers accepted as pilots take the seventeen-week liaison pilot course at San Marcos Air Force Base, Texas. They then attend a thirteen-week Army Aviation Tactics Course at The Artillery School, Fort Sill, Oklahoma, to qualify as Army aviators. Army pilots must continue to maintain flying proficiency.

Army aviators accepted for helicopter training undergo a five-week technical training course at San Marcos. This is followed by five weeks of tactical training at Fort Sill. Enlisted personnel with civilian pilot licenses also are accepted by the Transportation Corps for helicopter training; upon graduation they are appointed as warrant officers.

The Army envisages an expanded aviation in the future with marked growth in aerial transportation by helicopter. Enthusiastic planners talk of jet-powered helicopters. Interest also centers on the development of the "convertiplane," an aircraft that will combine all the advantages of the helicopter yet fly like a conventional airplane once it is airborne. It is not contemplated, however, that helicopters will replace the fixed-wing aircraft. Each type has advantages suited to its mission and purpose.

All in all, it is expected that the Army will use aircraft—both fixed-wing and helicopter—in ever increasing numbers as it keeps abreast of continuing developments in transportation and communication. Army aviation indeed has come a long way since 1942 when the first small Cub plane flew from the aircraft carrier *Ranger* off the shores of North Africa to be the eyes of the invasion forces' artillery. Today in Korea, Army aircraft are the eyes not of a single arm or branch but of an entire army.

IN PEACE PREPARED FOR WAR

MAJOR GENERAL HORACE L. McBRIDE

IN THE geographical heart of the Nation lies Fort Leavenworth, Kansas, the home of the Command and General Staff College of the United States Army. In May 1827, Colonel Henry Leavenworth led four companies of the 3d Infantry up the Missouri River valley to establish a new outpost for the westward expansion of the United States. He selected a site on the bluffs overlooking the river, pitched a tent camp and immediately began the construction of log buildings. This frontier fort which today bears his name was destined to play a permanent and leading role in history.

Strategically located at the junction of the Santa Fe and the Oregon trails, Fort Leavenworth furnished protection for the streams of Conestoga wagons moving on their westward trek. It served to keep the peace in the Indian lands of the Delaware and the Pawnee which it bordered.

During the Mexican and the Civil Wars, Fort Leavenworth continued to play an important part. It was here that General Stephen W. Kearny outfitted his Army of the West, a part of which under Colonel Alexander W. Doniphan marched from Fort Leavenworth through hostile territory to fight in the Mexican War engagements of Chihuahua, Saltillo and Matamoras. During the Civil War, the Fort served as a Federal stronghold, arsenal and supply base.

It was largely as a result of deficiencies in the officer corps which became apparent during the Civil War that a school was first established at Fort Leavenworth in 1881. Recognizing the dire need for trained officers, General of the Army William Tecumseh Sherman inaugurated a military school system. "As soon as the requisite number of troops can be assembled at Fort Leavenworth, Kansas, the Commanding General, Department of Missouri [will] establish a school of application for infantry

MAJOR GENERAL HORACE L. McBRIDE, USA, *Commanding General, Caribbean Command, was formerly Commandant, Command and General Staff College.*

and cavalry similar to the one now in operation for artillery at Fortress Monroe, Virginia," he ordered. The keynote of learning by application has remained one of the outstanding characteristics of Fort Leavenworth instruction.

The birth of the American general staff came shortly after the Spanish-American War. The near fiasco of Army operations, especially in the field of logistics, made the need for a group of trained planners clearly apparent. The far-seeing statesman Elihu Root, then Secretary of War, almost single-handedly pushed through the Congress a bill which authorized a general staff. As a part of the system provided by this Act, a General Service and Staff School was organized at Fort Leavenworth in the fall of 1901.



United States and allied student officers work on a division tactical problem at the Command and General Staff College.

U. S. Army Photograph

An outstanding contribution of those early days was made by Captain Eben Swift. As an instructor (he later became Commandant of the Command and Staff School) he introduced a course in "tactical orders." This innovation has become a familiar feature of every military school curriculum.

During World War I General of the Armies John J. Pershing leaned heavily on the graduates of the Command and General Staff School. The arrival in France of a Fort Leavenworth graduate marked him for an important command or staff assignment.

According to General Pershing, without the special training of these graduates the tremendous problems of combat, supply and transportation could not have been solved so successfully.

During the period between World Wars I and II, the General Service Schools at Fort Leavenworth were reorganized to meet the changing times. The resulting institution was patterned along the lines of staff organization utilized by General Pershing in France and provision was made for instruction of Reserve and National Guard officers as well as officers of the Regular Army. One of the great accomplishments of the School's leaders and faculty during this period was the preparation of a complete series of military texts distinctly American in character. A contemporary writer observed, "Leavenworth is a school for war. The course of instruction there, designed as a test of the physical, mental and moral fiber of the students, seeks to discover and develop those competent to lead and direct our armies of the future. No one enters upon the course there without trepidation and no one graduates without a feeling of relief. But no officer can honestly say that he has passed the course without having derived from it vast benefit."

After World War I, constant improvements in military education and doctrine were sought. Effective with the academic year of 1935-1936, a one-year course of instruction was adopted. The School was then known as the Command and General Staff School and its principal mission was to prepare officers for command and general staff duties. Concurrently, a Special Course of three months' duration—for all practical purposes an abridgment of the Regular Course—was conducted for Reserve and National Guard officers each year. By 1939, approximately five thousand officers from all components had graduated.

With the approach of World War II, the Command and General Staff School increased its tempo. Special General Staff classes were organized to meet wartime needs. The length of the course was reduced and the instruction intensified appreciably. Short courses of ten weeks were instituted and the student body rose from about two hundred to over a thousand. In the twenty-seven wartime classes approximately eighteen thousand officers of Army Ground, Air and Service Forces were instructed in general staff duties to meet the requirements of divisions, corps and armies, and of similar units of the Air Corps and service forces. All this was accomplished with a minimum departure from the traditionally high standards that had marked instruction of previous classes.

Throughout World War II the Command and General Staff School also contributed to the success of the allied cause by training hundreds of officers from allied nations. Attendance of officers from Central and South America was particularly large. Our Asiatic and European allies were also well represented.

Since World War II the Leavenworth school has returned to a regular ten-month course. Again its mission is to train officers as commanders and staff officers of divisions, corps, armies and the communications zone. The change in name from school to college is in keeping with its position as a graduate institution in the Army School System. As reorganized in 1946, the military educational system places the Command and General Staff College one level above branch schools. An officer after eight to fifteen years of service, and after graduation from the advanced course of a branch school, may hope to attend the course at Fort Leavenworth. Approximately 50 percent of the advanced course graduates are selected to attend the Command and General Staff College.

At the College they learn to use the tools of trade of staff officers. With practice in making staff estimates, in developing adequate and timely plans and issuing clear and concise orders, the students acquire many of the attributes of a successful commander. By application of the principles of war, including the techniques of combined arms and the principles of leadership, they become accustomed to the roles of the staff officer or commander. Most important, they develop their capacities to make sound and timely tactical decisions.

The map exercise is widely used as a device to demonstrate command techniques. Confronted by a tactical situation portrayed on a map, the student acting as a commander or a general staff officer is required to make appropriate estimates, decisions and plans and to issue implementing orders. The exercise is carried through several consecutive situations which portray as realistically as possible an actual military operation.

Problems are frequently presented as maneuvers in which the enemy is represented either by instructors or by other students. In this type of exercise the student commander or staff officer must base his decisions and orders on the reaction of the enemy. Adding to the realism, commanders and staffs of opposing forces frequently operate continuously for several days and nights.

Umpires guide the operation by injecting essential situations and decisions or directives. Tonnage requirements and movements of rations, ammunition and gasoline are planned with



Students solve a field problem during one of the terrain exercises given as part of the College curriculum.

U. S. Army Photograph

simulated restrictions on transportation imposed by bombed rail lines or damaged trucks or ships. Time and space factors hold troop movements to a realistic pace. The logistical situation is precisely portrayed. Casualty expectancy necessitates a normal flow of replacements to front-line units. The maneuver play takes into account every handicap or advantage which must be considered in modern technological warfare. All of these details are the province and the concern of the general staff officer.

Because the general staff officer is considered an extension of the person and personality of the commander himself, instruction is presented from the commander's point of view. Those matters which the commander would direct personally if he could be many persons at many places at one time are the problems of the general staff officer. Staff officers must be selfless thinkers, precise planners and detail experts. They must think ahead for every contingency. They must check to insure that every order is understood and promptly executed. Attention to every detail is the hallmark of the successful staff officer.

The Command and General Staff College extends its influence in several additional ways. Besides the Regular Course attended by approximately five hundred and forty American officers in the 1951-52 school year, a thirteen-week resident Associate

Course is being conducted concurrently for about two hundred Reserve and National Guard officers. Three resident courses of one week each are conducted for commanding generals and staffs of selected Organized Reserve Corps and National Guard divisions and logistical commands. Each of these courses accommodates approximately two hundred officers. In January 1952 a new General Staff Course of eighteen weeks for three hundred and fifty selected officers was inaugurated.

The staff and faculty of the College now consists of approximately two hundred officers headed by the Commandant and Assistant Commandant. In addition to the customary staff sections, a G5 (New Developments) section is set up under the Director of the Academic Staff to handle research and development for the academic departments. The faculty is composed of selected officers from all of the arms and services of the Army as well as representatives from the Navy, Marine Corps and Air Force. In addition, officers from several allied countries are members. To insure the use of modern educational principles of teaching, each new member of the faculty attends a two-week course in instructional techniques. The work of several prominent civilian educators has made a notable contribution to this program.

The College also trains instructors who will teach in the Special Associate Courses conducted by the continental Armies and provides their instructional material. Student officers who complete certain prerequisite extension courses may be enrolled in these Special Associate Courses. Instruction is divided into three two-week phases and is conducted in a location designated by each of the continental Army commanders. By completion of the Phase I, II and III sessions, an officer who can be absent from his business for only two weeks annually can obtain credit for an Associate Course after a period of three years.

Instructional material is also issued by the College to Organize Reserve Corps, National Guard and logistical units which conduct their own courses. Packets are prepared sufficient for five years of unit instruction. In this manner many officers of reserve components may obtain equivalent instruction with their home units when attendance at one of the longer staff courses is impossible.

The College conducts a large extension course program, comprising sixty-nine courses which roughly parallel the subject matter of the regular course. Currently this phase of instruction has an active enrollment of about ten thousand students.

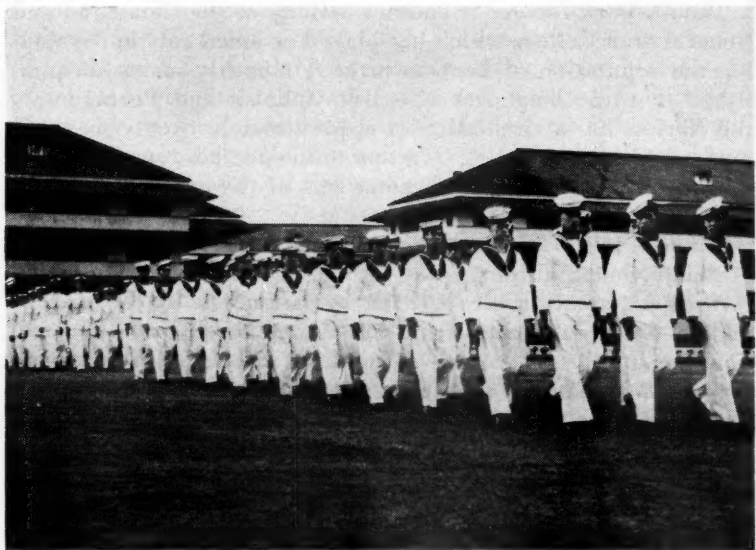
The *Military Review* is another activity of the Command and General Staff College which has played no small role in developing the reputation of Leavenworth. A monthly magazine published in three languages (English, Spanish and Portuguese), the *Review* has a circulation of approximately twenty-six thousand copies. By enlarging its scope to include editions in several languages, the *Review* has become one of the outstanding military publications in the world.

Material in the *Military Review* is divided into four categories—main articles, military notes, foreign military digests and book reviews. Original articles written by instructors at the College and by other authorities from the United States and allied nations are published as well as pictures and short articles concerning new materiel and modifications in existing equipment. The magazine's "Foreign Digests" presents articles from foreign publications translated, if necessary, by the staff.

Operating under the Chief of Army Field Forces, the College is charged with co-ordination of doctrine taught in the advanced courses of the branch schools. In this connection, it reviews training literature issued by the various branch schools and holds an annual conference of the commandants of all Army branch schools to discuss and clarify matters of doctrine.

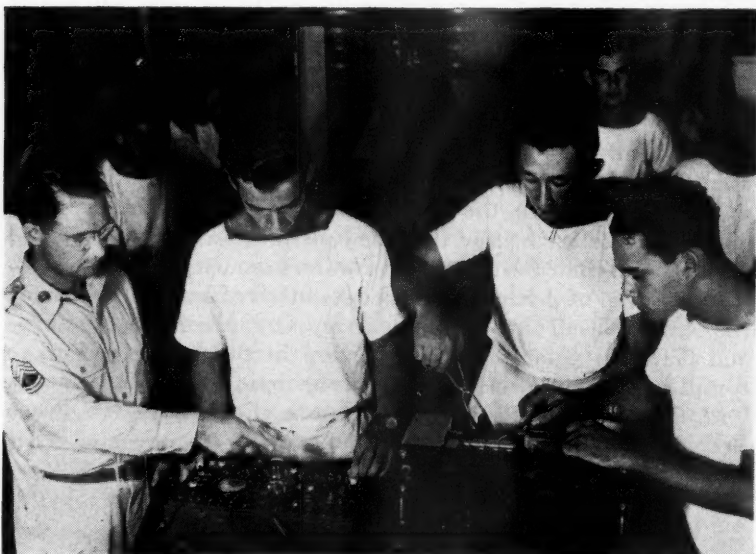
Closely allied to this responsibility is that of providing new doctrine. Approved Army doctrine is published in the form of manuals or training circulars. The Command and General Staff College is constantly revising outmoded manuals and writing new manuals and circulars to insure that Army doctrine is sound and current. Lessons from the war front in Korea are carefully analyzed. If proved sound and of universal application, they are incorporated in the College curriculum and in manuals.

It can therefore be said that the contribution of the Command and General Staff College to the Nation's security is the development in time of peace of a higher standard of leadership among the senior officers of the Regular Army, Organized Reserve Corps and National Guard; and instruction in the larger and more complex aspects of the military profession. The College motto, "*Ad Bellum Pace Parati*," has been well chosen—"In Peace Prepared for War."



This group of Colombian sailors with cadets from Guatemala and Nicaragua are among the sixteen nations represented.

U. S. Army Photograph



Colombian sailors receive instruction in radio maintenance at the United States Army Caribbean School.

U. S. Army Photograph

TRAINING FOR HEMISPHERE DEFENSE

CAPTAIN STANLEY LEWIS

“**U**no para todos y todos para uno” is the Spanish version of “One for all and all for one”—the motto of the United States Army Caribbean (USARCARIB) School at Fort Gulick in the Panama Canal Zone. Whether uttered in Spanish or English, the words express the singleness of purpose in the cause of Western Hemisphere defense which animates the School’s staff, faculty and multi-national student body.

Sixteen Latin American republics, extending from Cuba south to Chile, send selected members of their armed forces to the School. Officers, enlisted men, cadets and even sailors from some of the republics are included on the rolls along with United States Army personnel. An important by-product is the development of mutual understanding among members of the armed forces of the Americas.

Organized in February 1949 primarily for United States military personnel in the Caribbean area, the School has since graduated some five thousand students, more than fifteen hundred of whom were from Central or South American countries or from Cuba. Among the Latin American students have been cadets from the military academies of Nicaragua, Guatemala and Ecuador who were sent by their governments to take a nine-month course prior to being commissioned. This course included weapons, tactics and engineering and provided the equivalent of a fifth year of military schooling.

The School is composed of two main sections—Headquarters and Training. All operational and personnel matters are supervised by the Headquarters Section while instructional matters are under the supervision of the Training Section.

Training offered at the School includes automotive, clerical, communications, engineering, food service, leadership, military police, weapons and tactics, and supply activities. The Train-

CAPTAIN STANLEY LEWIS, Armor, was formerly on the faculty of the United States Army Caribbean School.

ing Section is organized in nine divisions—one for each of the principal subject fields. Each division is responsible for teaching related subjects for each type of training. In all, thirty-two subjects are offered in the nine fields.

Courses range in length from four weeks to nine months. They may be presented in either English or Spanish depending upon student requirements. Officer and enlisted instructors are well trained in their specialties and in the latest methods of teaching. Most of them speak both English and Spanish.

Upon arrival at the School, the Latin American students are given an examination comparable to the United States Army's General Classification Test to determine their ability to absorb and retain the instruction. Those with low scores are designated for additional assistance and guidance by the staff.

Each Latin American student is required to take one hour of instruction daily in the English language. As a result many who arrive at the School unable to speak English are soon able to make themselves understood without difficulty.

The School is vitally interested in the promotion of good relations not only with the people of Panama, its closest neighbor, but with the peoples of all of the Latin American republics. While acquiring military knowledge, the students are developing a bond of understanding through close association.

Before the United States Army Caribbean School was established at Fort Gulick, the Army conducted several courses for Latin American officers and enlisted men in conjunction with the training program for its own personnel. Schools in weapons, tactics, communications, and cooking and baking were open to Latin Americans.

Finally in 1949 a combined school was established by the Commanding General, United States Army Caribbean at the Fort Gulick Hospital, then being maintained only on a stand-by basis. Hospital wards were converted into classrooms and today the USARCARIB School has its own campus with ten buildings housing its activities.

Reports received during the past three years indicate that the School's graduates are applying their knowledge to improve the defense capabilities of their own armed forces, thereby strengthening the structure of hemispheric defense.

Today this School, which is contributing to the solidarity of the Western Hemisphere, is being watched closely by military and diplomatic leaders the world over. Those on the outside of the Iron Curtain like what they see.



RED CHINA'S FIGHTING HORDES

LIEUTENANT COLONEL ROBERT B. RIGG

V—Tactics and Logistics of the PLA

HALF frozen with ice, the river looks cold and raw. It is not deep but it does not have a bridge. This, you say, will give halt to the long Red column that has been marching so fast and so tiringly long. You no sooner pick out a nearby rock on which to sit than a noncom yells, "Tzo, tzo!" You get tired of hearing them yell that, for it means, "Go!"

At the river's edge there is no halt. Someone hauls out a potato masher grenade, unscrews the bottom cap and yanks the string. The explosion breaks the shore ice. Other grenades are tossed; but the army column pauses hardly long enough to telescope more than a battalion when the lead men splash into the water on foot. The column follows in trace—and a thousand or more men curse the cold water but march through it. Momentum has not been lost.

This is the fifth of a series of articles condensed from Red China's Fighting Hordes by Lieutenant Colonel Robert B. Rigg; 350 pages; \$3.75. Copyright 1951 by the Military Service Publishing Company, Harrisburg, Pennsylvania. This article may not be reprinted, as a whole or in part, without permission of the publishers. The opinions expressed are those of the author and do not necessarily represent official views of the Department of Defense or any of its agencies.

When you march with this army you get the feeling that you are going some place, not just obeying orders to cover miles. There is an urgency to these columns. No individual is obedient to the trace of another, yet like ants they never get much out of line. The form and force of these winding columns are strong. The pace is lively; no one seems to question why. The horses seem to influence the men to keep pace with greater speed. Everyone seems to gauge speed on the animals. While fifty miles a day is not unusual, twenty to thirty miles a night always should be expected of People's Liberation Army (PLA) units.

Why can these troops march so fast and travel so long on foot? The simple answer is that they are hardened to it by much practice—and they are not overburdened with equipment. Their personal gear is simple and their packs are light. They carry, possibly, the lightest weight of any soldier of any major power.

How Orders Are Transmitted

Orders must come before tactics begin. Chinese orders, for the most part, are verbal to units from divisions on down. This would seem to lend great flexibility to the lower combat elements. No excessive paper work, no time-consuming writing and paragraphing. It sounds fine to Western officers who, perhaps, have seen the over-use of written words and voluminous annexes. But one point must be remembered. The PLA does not have the excellence of communications or the quantity and quality of radio equipment that is common to Western army units. Furthermore, the Chinese have big organizations and there are many battalions to be finally instructed, ordered and redirected in combat.

The net result is that control and co-ordination over a wide frontage is clumsy, slow and lacking in flexibility. Red battalions often act and re-act on the initiative of their own commanders; but as a co-ordinated group of teams they lack excellence. The army moves well and exerts fine control over its routine marching; but in final combat, where it needs the maximum of control, it is very deficient.

For large co-ordinated attacks, it is a Communist practice to brief as many of the subordinates as possible on the pertinent details of the operation. Time and combat circumstance will modify this procedure some, but it can be said that the Reds try to read a good portion of their troops into the picture.

Chinese Tactics Differ from Ours

The Chinese Red Army is primarily a rifle and machine gun army while ours is a force that counts most on mortars, artillery, tank guns, rockets, bazookas and bombs. Herein lie differences in staying power and tactics. The Chinese have their small mortars which they use often and effectively. They have their artillery but in essence the PLA builds around its man-carried weapons.

On this basis we find Chinese small unit tactics predicated on both infiltration and mass attacks by infantrymen in which the rifleman carries the combat burden. Conversely, we build our squad tactics around 3.5-inch rocket launchers, 75-mm. recoilless rifles, cannon and other squads. The Chinese are still multiplying single men by rifles and machine guns to achieve a combat objective, whereas we multiply the shot and shell poundage by the explosive quantity per man.

Red officers, as a result of considerable combat experience (and not much formal study), modify their tactics to fit the terrain and situation rather than hew rigidly to conventional solutions. No single book could describe all the tactics these officers apply. They direct their troops with a remarkable fluidity of action and, like water, their hordes beat against the barriers flowing through the points of least resistance.

Tactically the Chinese have reached a transition point where they still retain and practice their old techniques, yet are borrowing from the Soviets and seeking to do things in a more modern manner. Chinese officers sometimes do not know whether to borrow tactically from their guerrilla past or to temporize with their Soviet future. Mixtures of tactics are resulting in many mistakes being made in combat.

The PLA does not have effective cavalry. It employs a little, but the army seems to lack the grasp of that arm that the Soviets maintain so well. Cavalry tactics and effectiveness can be dismissed as ordinary reconnaissance.

Chinese infantry tactics are enhanced by the ability of the soldiers to endure successfully for long intervals without food; by their ability to make long marches on foot, to climb hills and mountains and to dig in well when they arrive. Small units achieve much tactically by their skill at infiltration. This is where the Reds are at their best.

Defensively, the PLA has yet to show any unique qualities. This army has not been much on the defensive in recent years.

It is doubtful if it could muster the strong staying qualities of the Soviet Army, and it certainly lacks the artillery and anti-tank guns the Soviets found so necessary against an organized enemy. The Chinese show a tendency to use land mines but often neglect to cover their mine fields with fire.

The Chinese Red Army can integrate its defense works to a fair degree and can prepare skillful ambushes, but it is still more inclined toward mobile defenses than toward big systems of fixed defensive works. It lacks armor for mobile reserves in defense. Its probable future tactics, in any lengthy and extended defense, will be to leave a certain number of regiments or divisions in multiple island bases, from which they will sweep out and attack moving columns, then return to their hidden bases. PLA units have enough men to do this, at the same time saving out larger forces for "strategic" counterattacks.

What Is the Soviet Influence?

Soviet officers and Russian military textbooks are slowly making the PLA more dangerous, for they are teaching the Chinese how to mass their troops more efficiently. This does not mean that the Soviets have any mastery of logistics. They do not, and the Chinese have even less; but the Soviets have broad combat experience with large army groups, experience that will be of eventual value to the Red Asiatics. Therein lies their most dangerous tactical and strategic influence on the Chinese.

Where the Chinese formerly went by a combination of past experience (guerrilla-influenced) and instinct, they have now absorbed some of the more formal Soviet rules for tactical groupings. Instead of saying, "Liu, you take your unit there and Chou, you remain here", the Chinese lower commanders have learned to designate their tactical groupings as assault troops, secondary attack troops and reserves. Each is assigned its mission under those headings. Zones and boundaries are being designated with more precision. Main attacks are being narrowed down to prescribed frontages and are being supported by deep echelonment. Secondary attacks are widened to fit the studied concepts of the Soviets. The use of more maps, more top control and better communications is being emphasized. Better staff procedure, more warning orders and more liaison officers are points the Soviets teach in order to bring the PLA units under more formal guidance.

In modern communications equipment and practices the PLA has been weak, and still is; but the Soviets are improving

Chinese technique and tactics by assistance and instruction. Here is a fertile field for communications instructors. The PLA is weak in radio but it has reached the field telephone stage. Much of the control, however, is still by runners who hand-carry messages.

However, the Soviets are not going to teach the Chinese much about reconnaissance on the ground. The Chinese already are very aggressive at this.

The Chinese Communists do not have as much artillery in proportion to their infantry as the Soviets do, but they like to use artillery as much as the Russians. The day soon will arrive when the PLA will have greater and more effective artillery support—organized, trained and applied according to the Soviet concept of massed guns.

Armor-wise, the Chinese have a lot to learn. Every one of the PLA's parade tanks must be replaced by a new one. It has been believed that the Soviets would furnish the Chinese with a number of medium tanks, if they have not already done so. Quite probably the Soviets have pondered the poor showing the North Koreans made with armor and have concluded that the Chinese Reds would not do much better. The Soviets are aware of the deficiencies of China's infantry-heavy army and doubtless have concluded that it is better to bring the Chinese Reds up to strength in artillery, motor transport and other basic essentials, than to load them with armor and thus foster a lopsided growth.

On the objectives of combat the Soviets and the Chinese have little disagreement, for the Soviets hold that the primary objective is "the destruction of the enemy's armed forces and his supplies." But as to how this is to be done there may be differences of opinion—on strategy, tactics and technique. On these subjects there may be some conflict between Chinese and Soviet concepts. It is probable that the Soviets expressed impatience with the Chinese over the inconclusive results in Korea. The Chinese are slower because of the nature of their past experience and the lack of modern field forces. Neither Communist side weeps over wasted losses in manpower, but the Chinese, who are paying the daily death price in casualties, are going to want to conduct the war along their own lines. Both the Soviets and the Chinese are Red to the core but they are of different nationalities, with distinctive characteristics and pride of race.

Summed up, the greatest Soviet influences on Chinese tactics

are the lending of formality, form and better control of units in the application of their traditional tactics; teaching the Chinese to achieve better artillery support; and, in general, strengthening Chinese tactics by the indirect aid of a more modern logistical know-how and increased communication effectiveness which has resulted in more adept handling of large troop masses.

Shoestring Logistics

To view this army from the rear is awe inspiring. The regimentation of disciplined men in uniform is one thing, but the obedience, efficiency and amount of traction generated by columns of horses, carts, trucks, wagons and farmers—all gathered from the local region—give witness to an organizational capacity that, for all its appearance of antiquity, is unique and, to a degree, efficient.

But a modern quality is lacking. The early morning fog finds these exotic supply columns moving rapidly to find shelter before the sun and enemy aircraft can seek out the vehicles that clog the roads. Silent civilians, their mask-like faces uncleaned for days, trudge with their empty stretchers toward the front. Shut in, surrounded and drawn along by the men in uniform, the gloom on the faces of these civilians portends the seriousness of their tasks of tomorrow. Whenever the trucks or the horse carts slow or stall on the muddy, slippery roads, these silent men, the PLA's main evacuation service, keep moving on, gaining a slight bit of ground on the rough shoulders of the road. Here and there a body of soldiers will talk kindly with these men, offering them a few quick words on the latest rumors and exchanging knowing glances at each other's cigarette supply. The bond is evident; the soldiers know that, on some tomorrow, their bodily survival may depend on the lean legs of these black-gowned men whose very large numbers always seem to portend larger casualty lists than a few modern ambulances ever would.

Speed is not a primary concern with the PLA; that is, speed in motorized terms. It is an infantry army that marches on its own feet at rates of two and one-half to four miles an hour. The two-wheel horse cart averages three to five miles an hour. Roads in China are notoriously bad. In Manchuria, for example, I averaged at best eighteen miles an hour in a jeep, and the usual average was ten to twelve miles an hour. Thus there was not the contrast between horse and motor speeds that one

would expect. Archaic and out-dated horse carts are still favored by the PLA; and they are effective transport for that army, even though it is now using thousands of motor vehicles.

The ungainly caravans of motor vehicles, horse carts, and sometimes even camels, move at varying paces, carrying loads of different weights. The sacks of grain and rice, the boxes of shells and explosives, the conglomeration of other supplies and equipment carried, give visual evidence that logistical standardization is lacking. But, like a spring uncoiling, the power of the movement is characterized by the harnessed energy of great masses of labor. Whatever its deficiencies, the PLA compensates in good part for its logistical weakness by utilizing the labor and sweat of millions.

The Peasant-Powered Army

When Mukden fell in November 1948 and Lin Piao was victorious in Manchuria, he swung his army columns southwest and marched through the gates of the Great Wall of China. Lin Piao's columns, marching six hundred miles in twenty-two days, included trucks as well as horses and carts. The route traversed was mountainous, the roads rougher than the trucks could take. Bridges were out and the ice was too thin to support men and animals, so the infantry forded the rivers. But the newly captured trucks lagged behind the wagons and distant reconnaissance revealed some stretches of road as almost impassable. This mobile army which, almost overnight, had invested its cargo weight in American trucks (taken in Mukden), was on the verge of losing its famed mobility because of poor roads and broken bridges. Lacking organized engineer units with which to repair these, the local manpower was regimented. Thus, in peopled China, the army could resort to the eternal solution of that land, the labor of coolies.

The Communist army gathered about fifty thousand peasants and, with only hand tools, these freezing laborers worked in the snow to restore one hundred and eighty miles of road to truck-passable condition. It was reported that only thirty-six hours of labor were required to complete the project. General Lin Piao's columns marched south, to fight briefly and then to parade these trucks in Peiping.

In the Huaihai campaign, eighty thousand civilian laborers were put to work near the front while one hundred thousand more were ordered to work on roads and bridges. On 3 December, thirty-seven thousand more farmers and laborers were ordered

to the front to give direct assistance to the combat units for transport of food and ammunition and the evacuation of wounded. Marching and countermarching, the Communist armies confused, blocked, attacked and overran the Nationalists in large numbers. The Red columns made the utmost use of their vaunted mobility and the Nationalists could not match them. But Communist soldiers were finding that their supplies were lagging. At one unidentified portion of the mixed front supplies were badly needed. Again, no reason to call a quartermaster! The Red command quickly conscripted from Huaian and nearby districts twenty-three thousand hand carts, had them loaded with grain, and ordered the civilians to march! They did, for two days. The Red troops were fed. There was no advance staff planning; just orders to the people.

One sound logistical factor has been paramount in this Communist army up to 1950. Its leaders have not allowed the regular army to grow larger in troop strength than could be supported by the economy of the areas they controlled. This was an important factor in the army's success, for its hordes were never too hungry too long and a decent level of morale was maintained. When the number of men exceeded the number of guns, the Reds simply placed the surplus personnel in the ranks of the militia and gave them spears.

Now the army has entered its expensive era. No longer can hand labor alone supply this army with its needs. The PLA requires planes, oil, tanks, trucks and heavier equipment which must be bought from the USSR—at considerable monetary expense. At its present strength, the army is a burden to the nation; but it is still established on a financial and economic base that can support it because Mao Tse-tung is putting all of China's wealth into the armed forces. However, were the PLA to expand its ranks several fold, it would run into the dangers that so weakened the Nationalist army.

One of the reasons why the PLA gained combat dominance over the Nationalists was that the PLA placed a larger proportion of men (per unit) in the firing lines than the government armies were able to do. This was possible because the PLA used civilians to evacuate their wounded and transport the great bulk of their supplies. A Nationalist force of ten thousand soldiers, on the other hand, included many who were formally organized in service of supply elements.

This was the pattern of logistical support in the Civil War. It is essentially the same in the PLA today, except that the

Communist army has a greater number of trucks. These are under military control in organized units. Motor transport is centralized under field army and group army control. By our standards, lower units still lack adequate motor vehicles.

Medical Service Is Poor

The PLA's medical service is makeshift. Even the system of stretcher bearer evacuation is makeshift. The Chinese Red soldiers who lie on the ground and clutch their bloody wounds usually lack first aid kits. They are in serious trouble. Evacuation at best is uncertain, real medical treatment doubtful. The odds are that the majority of seriously wounded Chinese will die.

No figures are available as to the number of medical officers in the PLA but it is doubtful that the Red Chinese field armies in combat are served by more than one medical officer for three thousand men.

The Red soldiers of China are not yet inoculated against disease under any organized system. Here again the army lacks modernity. Despite the immunity that many of its soldiers may possess against diseases endemic to regions of China, the PLA is wide open to plague and many other diseases. It has reportedly suffered sickness casualties in Korea equal to its combat losses.

The PLA is louse-ridden. I have sat for hours amid dozens of Red Chinese soldiers who undid their clothing down to the skin and flicked off the lice.

China has no munitions industry. The nation has never manufactured its own artillery shells and big guns although the sprawling Mukden arsenals are capable of a very limited manufacture of light artillery. Possibly by this time they can produce some large shells. Thus the supplies of munitions that the Chinese Reds require must come from the USSR. That will be the source of supply for at least the next ten years and it will cost the Chinese money and food, for the expenses are high for munitions transported across the lengthy Trans-Siberian Railway. This is a new problem for the Reds of China and is causing much worry.

The PLA possesses a greater variety of types and makes of weapons than any other military force. These weapons are old and the ammunition supply for these cast-offs is difficult at best. Today's weapons and materiel must gradually be discarded in favor of new and standardized equipment of Russian design. Although the Chinese Reds may brag about their cap-

tured American weapons, actually they do not want them.

The PLA is all of thirty-five years behind the United States Army in logistical organization and concepts. But the future holds the promise that the PLA and its regional logistical facilities will improve. The Soviets have between twenty thousand and fifty thousand technicians and "advisers" in China today. The impact of this foreign assistance is already evident in the work being done on airfields, railways and roads. The Soviets are giving splendid direction to the establishment of a sounder logistical base for China and its army. Today's assistance is probably more energetic and efficient than that which the Soviets gave China between 1924 and 1927.

There have been some sharp disagreements and considerable friction behind the Iron and Bamboo Curtains. Mao Tse-tung's men find the Soviets consistently demanding food, cash and controls in return for Soviet arms and materiel. It took the Chinese trade delegation four difficult months to negotiate the 1951 agreements for barter and supply of Russian materiel under the three hundred million credit program. This was only the beginning. The Red Chinese are unhappy over Soviet figured prices. A Russian bomber costs the Chinese almost one quarter of a million dollars. A propeller-driven fighter plane costs \$68,200, while a T-34 tank lists at \$111,000. Actually these are bargain prices (tanks in the United States cost almost \$250,000 each) but not to the Chinese economy. The rub is China's unbalanced national budget and serious inflation. It is far harder for the Chinese to raise \$40,000 for a Soviet artillery piece than it is for the United States to pay \$75,000 for a similar item. This is why the Peking regime is forcing the people to contribute funds to the direct purchase of planes, guns and tanks.

The Soviets want cash for many items, but foodstuffs are also included in these complicated exchanges. Between September 1949 and September 1950 Red China is reported to have sent fifteen million tons of food to the USSR in return for Soviet military aid. Deliveries are currently slow from the USSR and this irks the Chinese who have many trucks idle for lack of oil, spare parts and tires. Soviet demands for more controls within China constitute the biggest worry for the Peking war lords. They see the Russians already dominating in Sinkiang and Manchuria. So, to modernize the PLA, the Red Chinese militarists are having to pay through the nose for everything!

The Landing at Vera Cruz

The War with Mexico witnessed the first large scale amphibious operation by American troops when, on 9 March 1847, General Winfield Scott landed his army of ten thousand men about three miles southeast of Vera Cruz on the sheltered beach of Mocambo Bay. The landing was facilitated by Commodore David Conner who had arrived with the American squadron several days earlier at Anton Lizardo, about a dozen miles beyond Vera Cruz. There he met the troop transports and offered to make his larger ships available for the landing.

On the morning of a perfect day the soldiers boarded the frigates *Raritan* and *Potomac* and the smaller vessels. In two hours the fleet was off Sacrificios Island where "in close quarters, but without mishaps or even the least confusion, each dropped anchor in its allotted space."

On a signal from the lead ship, the *Massachusetts*, seven gunboats formed a line within range of the beach and cleared for action. Sixty-five surf boats were rowed by naval crews to the transports and took on fifty to eighty soldiers apiece, the whole of General William Jenkins Worth's brigade. A shell whistled overhead from the beach where Mexican cavalry had been seen. The gunboats returned the fire, raking the shore with shells and breaking up the cavalry. At the flash of a signal gun the surf boats struck out for land.

Historian Justin Harvey Smith's description is vivid: "Here was the chance of the enemy, for our vessels could not fire without endangering Americans; but no enemy was to be seen. Led by their color-bearers the regulars quickly splashed ashore, formed in a moment, charged to the crest of the first dune, planted their standards and burst into cheers; the men on the ships, tongue-tied for some time by an excitement and anxiety that made their brains reel, answered with huzza after huzza till they made the bay seem peopled with victorious armies."

The scene on the back cover is from an 1848 lithograph in John Frost's *Pictorial History of Mexico and the Mexican War* in the collection of the Library of Congress.



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